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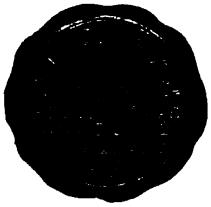

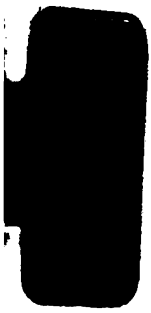

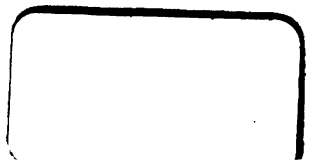

TRANSACTIONS OF THE

SECTION ON

Cutaneous Medicine and Surgery

of the
American Medical Association
at the Fifty-eighth Annual
Session, held at Atlantic
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CONTENTS

PAGE.

Venous Angioma of the Skin Showing Beginning Malignancy. Chairman's Address. R. R. Campbell..... 9
Deformities of the Vulva from Early and Late Indurating Edema. R. W. Taylor..... 20
Treatment of Syphilis by the Intramuscular Injection of Soluble Mercurials. W. S. Gottheil..... 37
Significance and Treatment of Itching. L. D. Bulkley..... 54
Cutaneous Tuberculosis. J. F. Wallis..... 74
Lichen Scrofulosorum. H. G. Anthony..... 81
Vessel Changes and Other Histologic Features of Cutaneous Syphilis. J. A. Fordyce..... 86
Trichopathophobia. A. D. Mewborn..... 102
Liquid Air in Dermatology; Its Indications and Limitations. H. H. Whitehouse..... 116
Present Status of Phototherapy. J. F. Schamberg..... 138
Observations on Pemphigus. J. Zeisler..... 159
Opsonic Therapy in Skin Disease. H. R. Varney..... 170
Onychomycosis Trichophytina. A. Ravogli 182
The Salicylates in the Treatment of Lichen Planus. M. B. Hartzell 192
Roentgen Ray Technic in Dermatology. M. K. Kassabian. 200
Therapeutics of Tuberculosis of the Skin. G. MacGowan.. 211
Treatment of Acne and Chronic Eczema. R. H. Boggs.... 228
Lupus Erythematosus. M. L. Heidingsfeld..... 237
Blastomycosis in an Infant. J. B. Kessler..... 253
Two Seborrheids of the Face. M. F. Engman and W. H. Mook 260
Exhibition of Patient with Tuberculosis of the Nose. J. V. Shoemaker 271
Cytology of Gonorrheal Discharges. R. W. Taylor..... 277
Minutes of the 1907 Session..... 283
Members of the Section..... 287
Index 290

VENOUS ANGIOMA OF SKIN SHOWING BEGINNING MALIGNANCY.

CHAIRMAN'S ADDRESS BEFORE THE SECTION ON CUTANEOUS MEDICINE AND SURGERY AT THE FIFTY-EIGHTH ANNUAL SESSION, HELD AT ATLANTIC CITY, JUNE, 1907.

RALPH R. CAMPBELL, M.D.
CHICAGO.

In recent years, for no good and sufficient reason, the interesting subject of venous angioma has been almost entirely, if not absolutely, neglected by the dermatologist, and in consequence of this the field has been appropriated by the general surgeon.

I trust that bringing the subject to your attention again may result not only in reclaiming a subject which rightfully belongs to the dermatologist, but in stimulating original work on it to such an extent that in the future our text-books will not neglect entirely a condition which is of so much importance to the dermatologist.

Through the courtesy of my colleague, Dr. M. L. Harris, I have had the opportunity of studying the following interesting case:

Patient.—J. W. H., civil engineer, American, aged 38, married.

Family History.—Father, 70 years old, living and well. Mother died, at the age of 69, of tumor of the stomach, probably carcinoma. One sister died of pulmonary tuberculosis at the age of 21. One sister died suddenly at the age of 38. One brother died of dysentery at the age of 2. Four sisters are living and well. Two maternal uncles died of pulmonary tuberculosis. Patient has two children who are living and well.

Personal History.—The patient had measles and parotitis

during childhood and had rheumatism (?) at 15 years of age. Otherwise he has always been well. He denies venereal disease.

Present Trouble.—The patient presents three tumor masses on the right leg; one on the anterior surface of the foot just below the ankle joint, about the size of a 50-cent piece; a second, covering almost the entire anterior surface of the lower half of the leg; and a third, just above the latter, about the same size as the first. The areas are bluish-gray, covered with a dirty crust; irregular and nodular on the surface, and elevated from one-half to three-quarters of an inch. Parts of the areas appear to be solid; others can be compressed and diminished in size. The largest area presents a deep ulcer, about the size of a dollar, the edges of which are ragged and bleed easily. These areas were congenital and at first were of about the same size. They were red, smooth and non-elevated. Later they began to take on a crusty appearance, the crusts being adherent and at times one-half inch in thickness. If the crusts were picked or knocked off, the tumors would bleed freely. The whole tumor would always bleed easily, often profusely, but he was always able to stop it himself. Any part of the tumor which became bruised or injured would heal, only very slowly, often requiring years. Until the patient was 6 years old the areas never ulcerated. At this time he was brought to Chicago, and the areas were cauterized with the actual cautery. There then ensued severe breaking down of the tissues, and the lesion never healed entirely, but the crusting tendency ceased. Occasionally there would be slight pain. The patient's occupation, that of surveyor, necessitates his walking from five to twenty miles daily, and in April, 1904, he wore a pair of leggings with metallic fasteners, which pressed against the tumor, and resulted in sloughing of the tissue and producing the ulcer described above. This has increased in size, regardless of treatment, and is rather painful.

Diagnosis.—Ulcerating congenital angioma of the right leg.

Operation.—July 5, 1904. Excision of tumors. Skin grafting. The man was discharged, well, Aug. 17, 1904.

Macroscopic Examination of Tumor.—The tumor formed a large, flattened, irregular, sponge-like mass, which on section was easily seen to be composed of variously sized blood channels. The skin covering the mass was thin and presented very few small hairs. Near the center of the external surface was a large excavated ulcer from 3 to 4 cm. in length by 2 to 3 cm. in width. The edge was somewhat thickened and firmer than the surrounding parts.

Microscopic Examination.—The tumor was seen to be made

up of large and small, irregularly-shaped, thin-walled blood spaces, lined with endothelium. Where the spaces were small they were separated by rather a large amount of connective tissue, which was rich in round cells; but where the spaces were large the blood vessel walls, which were composed of but a single layer of endothelial cells, lay side by side, with almost no intervening connective tissue. Some of the spaces were either entirely or partly filled with a homogeneous, hyaline-like material. Where the homogeneous material occupied but a portion of the space, the remainder was still filled with blood. This hyaline material did not appear to be uniformly distributed throughout the tumor, but occurred in scattered areas only. The epithelium covering the tumor was not thickened except in the neighborhood of the ulcer. Surrounding this great proliferation had taken place, and long, finger-like prolongations dipped down deeply into the underlying tissue, but no nests or pearls were found. These projections often coalesced, and in the space thus surrounded were found large blood spaces. These epithelial prolongations suggested an epithelioma, as did the macroscopic appearance of the ulcer, but the absence of nests and the fact that no epithelial formation was present on either the lateral walls or the base of the ulcer excluded this view as to the cause of the ulcer. One could not help feeling, however, that the excessive epithelial proliferation marked the beginning of malignancy about the old ulcer. The base of the ulcer showed characteristic granulation tissue with marked round-cell infiltration. This connective tissue layer closed the large blood spaces, and this accounts for the comparative freedom from hemorrhage at the site of the ulcer.

McGregor[1] showed a case before the Glasgow Pathological and Clinical Society, Oct. 12, 1903.

History.—The patient was a girl, 15 years old. The family history was negative. Capillary nevi had been present unchanged since birth. The swelling appeared when 9 years old, gradually increasing in size. At first it was small and dark-bluish; there was no pain. After increase in size, there was difficulty in walking, with sharp, jagging pain. At the time of admission to the hospital, the girl had a large diffluent swelling of the left thigh, extending from the junction of the upper and middle thirds of thigh in front to the level of the upper border of the patella on outside of limb. It occupied most of the outer side of thigh in that area, and its inner border corresponded to the line of the internal saphenous vein. Its consistency was

1. A Large Venous Nevus, Glasgow Med. Jour., 1904, lvi, 34-37.

generally soft. There were many tortuous veins around the periphery of the growth. The tumor was prominent at the center, shading gradually to healthy tissue. This prominence almost disappeared on pressure. Scattered irregularly over the surface were twelve small pigmented spots; these were purple and slightly raised.

Treatment and Result.—The patient was treated by ligating the principal veins running into the tumor. As a result the tumor diminished in size, and pain and tenderness were lost. Interesting features of the case were the large size of the nevus; the occurrence of small capillary nevi resembling angiokeratomata, which were evidently independent growths from the rest of the tumor; the appearance of enlarging cicatrices at seat of wounds of operation, resembling false keloids.

Audrey[2] reports a case of a man, 45 years old, syphilitic.

History.—For many years he had an unusual skin lesion above the right eyebrow. It was a small, round, disc-like tumor, very little elevated above the surrounding tissue, and formed by an area of very firm, superficial infiltration. The epidermis covering it was smooth and shiny, having small, bright red spots scattered over it. It was not deeply adherent, and there was no pain. From time to time it would swell up and form scabs on top which would then come off and cause profuse bleeding. The lesion would then heal up as before. The tumor was excised.

Microscopic Findings.—The epithelial covering was thin with no papillæ. Underneath was an almost fibrous dermis, containing many capillaries. In some places this was healthy; in others were found epithelial areas typical of epithelioma. These epithelial areas were very diverse, both in form and size, and were found throughout the entire thickness of the dermis, separated at times by fibrous connective tissue and sometimes by tissue greatly infiltrated by plasma cells. In fact, it had the usual structure of *ulceras rodens*. The unusual part of the structure consisted in the presence of large blood spaces filled with blood and situated very superficially. One or two giant cells were found. The tumor, therefore, was an angioma of slow development, but combined with superficial angioma.

The histologic examination accords perfectly with the symptoms observed (hemorrhage, long duration, per-

2. Sur un Anglo Epithelioma de la Peau, Jour. de Mal. Cut. et Syph., Paris, 1900, xii, 759-761.

sistence), but the exact significance of the lesion remains undetermined.

Did the angioma precede the epithelioma or the epithelioma precede the angioma? Or are they contemporaneous? Or should one consider the whole lesion as the terminal stage of an evolution, etc., according to Cohnheim's theory that the lesion is the tardy development of a congenital tumor? Audrey inclines to the last proposition. The angioepitheliomas should, it seems, be considered as a peculiar type of epidermal neoplasms of embryonal origin.

Morestin[3] reported a case of a little girl, 10 years of age.

History.—The tumor existed from birth on the inner mucous membrane, on the side of the lower lip. Vertically, it extended from the free edge of the lip to the furrow formed by the gums and the lip. The whole tumor resembled an almond without its shell. The surface of the tumor was a red color, with little raised places here and there, some of which were violet-colored, while others were a pale pink. On palpation the tumor was firm, non-reducible, rather well limited, and grown in the mucous membrane, though showing some mobility on the muscular layer. There was no pain. The diagnosis was circumscribed angiolymphangioma. The tumor was excised.

Microscopic Findings.—Sections showed a large number of blood vessels and enormous lymphatics. The labial glands were altered and inflamed. The mucous membrane covering the tumor was thickened and modified, and contained a great number of blood capillaries and dilated lymphatics. The papillæ were higher and larger than normal.

Stangl[4] first gives a short résumé of the nomenclature of tumors arising from the blood vessels; then he reports two cases.

CASE 1.—A girl aged 20, for many years had a small, bluish-colored, slightly swollen place on the ulnar side of her right forearm. This began increasing in size. A smaller similar spot appeared on the skin near by. The tumors were excised.

Microscopic Findings.—In the loose subcutaneous fat ran broad bands of dense connective tissue, in which appeared

3. Tumeur Congenitale de la Levre Inferieure: Angio-Lymphangiome, Bull. Soc. Anat. de Par., 1898, lxxiii, 430.

4. Zur Kentniss der Perithelialen Blutgefasstumoren der Haut.

large, irregularly-shaped blood spaces, which often communicated with one another and were filled with blood. The walls of these spaces showed the following characteristics: In some places they showed a single layer of flat endothelial cells, so that the small spaces had the appearance of capillaries. In other places on the layer of endothelium were one or more layers of cubical cells, with dark nuclei, and small irregular protoplasmic bodies. These cells lay directly on the endothelium, so that it seemed to be surrounded by a thick cell-mantle. These spaces contained blood. In the connective tissue septi also ran apparently unchanged capillaries. The stroma of the tumor was dense connective tissue, not very rich in cells.

CASE 2.—A girl, aged 18, had a tumor, the size of a nut, on her little finger. She also had a smaller one near by. The tumors excised.

Microscopic Examination.—The tumors possessed firm capsules, were rich in cells, and contained large blood spaces filled with blood. The tumors were made up of medium large, polygonal, or round cells, having a clear protoplasm, with round chromatin bodies and clear cell boundaries. The cells lay directly on one another and showed no intercellular substance. The stroma of the inner part of the tumors was particularly rich in blood vessels, which seemed to be intimately connected with the tumor cells. The blood vessels of the tumors showed marked changes. In the smaller arteries the endothelial lining could be clearly seen, but in others it seemed to have a homogeneous appearance. Many times the endothelial layer disappeared, and in place of the vessel lumen there was a solid homogeneous structure, on which the tumor cells above described lay. There were hemorrhages throughout the tumor. Stroma was lacking in the inner part of the tumor, and broad bands of connective tissue ran down from the capsule into the outer layers.

Stangl[4] discussed the question as to whether tumors were of epithelial or connective tissue extraction. He considers the two cases described as rightly named perithelial tumors.

Ribbert[5] says that to understand clearly the genesis of angiomas one must decide between two questions:

Is the tumor a simple dilatation of the vessels in a circumscribed area? Is it the result of new growth? If one holds to the second opinion, one must decide

5. Ueber Bau, Whachstums und Genese der Angiome, Arch. f. Path. Anat., etc., Berlin, 1898, cli, 381-481.

whether the tumor arises from increase of tissue of normally inserted vessels or grows out of an originally independent germ which has become free from its normal connection.

Ribbert advocates the latter view, and the following article is to strengthen proofs already set forth in former article.[6]

CAVERNOUS ANGIOMA.

Two varieties may be selected as examples: First, skin angiomas having wart-like form; second, angiomas of the liver.

Angiomas of the skin are characterized by their intimate relations to the neighboring structures; that is, sometimes with the subepithelial connective tissue and sometimes with the deeper corium, where the vessel walls are of endothelium placed directly in contact with the connective tissue. The connective tissue is sometimes scanty and sometimes plentiful, but often irregular, so that little groups of vessels are often cut off from similar groups by thick connective tissue bands. The angioma is thus divided into lobules. The connective tissue is mostly poor in cells, but rich in nuclei. The new growth gradually shades into the surrounding corium, so that there are no sharply defined borders to the tumor.

Neither small openings nor any signs of them are found connecting the blood spaces of the tumor with the vessels of the neighborhood, nor is there any indication that, by the gradual narrowing of the wide lumina, they are transformed into capillaries, or that the lumina themselves are transformed into capillaries. These views are not changed at all by the fact that in angioma there are arteries running into the tumors and veins leaving them.

To show the independence of the blood spaces in angioma from the blood vessels of the surrounding tissue, Ribbert injected some angiomas. By means of a

6. Ueber Ruckbildung an Zellen und Geweben und uber die Entstehung der Geschwulste.

direct puncture into the tumor mass he found that only the angioma itself was colored, while the surrounding tissue was not affected.

Microscopically, it was shown that the blood in the spaces of the tumor was either driven out or mixed with the material injected, while nowhere did the coloring matter pass the borders of the tumor.

There existed no anastomoses with the capillaries in the surrounding tissue; the angioma showed a circulation shut off within itself, with only a connection with the arteries and veins of the neighborhood.

These results would not allow him to think that the tumor grew in extent through its relationship to the surrounding capillaries which became dilated. The growth came, then, from a dilatation of the vessels already existing there, and by their increase in number and size by a process of new growth.

Considering these angiomas as new growths, then, we have no right to infer that originally the vessels of the new growth were not included in a normal way in the circulatory system, and only later should have isolated themselves as a tumor. It is much more probable that the relation of the tumor to the surrounding tissue was the same from the beginning, and that the complex system of vessels composing it had always had an independent existence.

Since the multiple, wart-formed angiomas here described are congenital, we may refer their beginning to the time of the development of the skin, and may infer that in the formation of a circulatory system a blood vessel tumor was not formed in a normal way, but grew by the assistance of a little piece of independent connective tissue imbedded there.

ANGIOMAS OF THE LIVER.

After investigating these tumors, Ribbert comes to the conclusion that they are also independent tumors, growing not by spreading to surrounding tissues, but from

within themselves. (*Die Telangiectesie. Das Lymphangiom*). He describes these tumors and gives a description of the genesis of the cyst formation.

Dutton[7] reports a case of a girl, 8 years old.

History.—A large nevus on ear was treated and became somewhat improved. Two small tumors appeared; one larger, a somewhat pedunculated tumor, about the size and shape of a pea; the other smaller, but similar. The tumors were removed and sections were made.

Microscopic Examination.—The tumors showed but poor development of both epidermis and corium; no papillæ. Large veins ran in every direction, surrounded by thick fibrous adventitia. Outside this adventitia and running parallel with blood vessels were dense masses of endothelial cells, imbedded in hyaline material. Outside these endothelial areas were strands of fibrous tissue which limited them and separated them from each other.

In looking over the literature, I could not find any tumors described which correspond to these.

Lamy[8] states that angiomas are congenital vascular productions, due to modifications occurring in the course of embryonal development. They most often occur in the regions in the face and neck where the branchial clefts appear. Virchow has named them angioma-fissuraux.

The angiomas of the face appear in a series, and their extent marks the differentiation of the germinal areas at whose expense they are formed. One has then: Angiomas of the frontal germinal area; angiomas of the superior maxillary germinal area; angiomas of the inferior maxillary and those of the second branchial arch.

This differentiation, according to germinal areas, is confirmed by the analogy which angiomas present with other congenital malformations (intermaxillary clefts;

7. Two Vascular Tumors, with Marked Endothelial Proliferation Growing from the Skin in the Neighborhood of a Large Congenital Nevus of the Right Ear of a Child, Liverpool Medico-Chir. Jour., 1898, xviii, 369-375.

8. Contribution à l'Etude des Angiomes Fissuraux, Paris g. Steinheil, 1900, No. 515, p. 64.

atrophy of inferior maxillary—congenital lymphangiomas).

In order to explain the production of angiomas, it is necessary to have a sufficient cause (disease of the embryo), favored by histologic circumstances (a vascular region) on an anatomic position (one where such lesions frequently occur), at an early period in the development of the embryo.

BLOOD ANGIOMA.

Vascular tumors that are macroscopically recognized as such may be differentiated in many instances only with great difficulty from the simple dilatations of pre-existing blood spaces. To call the lesion a tumor it is essential to prove a progressive new formation of vessels. In such cases it is not necessary that all three layers of the vessels participate; frequently the muscularis is entirely wanting. Again, we see, in tumors even of an absolutely benign character, the irregularity in the formation of the details of the cellular construction. Ordinarily we make a distinction between the different forms of simple "blood angioma": 1, Angioma simplex; 2. cavernous angioma; 3, hypertrophic angioma.

The first and third forms are closely related with each other and may exist combined. Angioma simplex appears principally in the skin as a light red or blood-red discoloration, in many instances not in the form of a neoplasm. It consists of newly-formed arteries and veins, which are surrounded by an abundance of connective tissue. In cases of telangiectasis we are dealing chiefly with neoplasms of the capillary vessels. If they are very abundant, the result may be a vascular nevus, ordinarily with thinning of the epidermis and flattening of the papillary bodies.

These simple, tumor-like growths of the subcutaneous vessels, which in their structure are often similar to the little fat clusters of the subcutaneous cellular tissue, resemble very much the form to which Ziegler has ap-

propriately applied the term hypertrophic capillary angioma. The substratum of this form of angioma consists of thickened capillaries and in a hardened section of an atypical case with little intervascular tissue, in which the empty capillaries appear compressed, the microscope may show an appearance much resembling a benign adenoma, as of a sweat gland.

Diagnostically, much more easily do we recognize angiomas of wide cavernous spaces, often found in the liver, but likewise frequently seen in this form, which is the most frequent, and which may occur in almost any organ, and is absolutely benign in character, so long as no damage is done by its position or from hemorrhage. A transformation into a malignant mixed form, with the appearance of nucleated cells in the connective tissue stroma, is a very rare occurrence.

Angiosarcomata which are not very uncommon have an entirely different structural development. These may be a combination of hemangiomata, with increase of connective tissue or fat (angiofibroma and angiolipoma), which should be called telangiectatic fibroma or lipoma. The cavernous type may lead to thrombus, the lumina becoming entirely filled with round cells; furthermore, it is possible to find a brownish pigment which can easily be differentiated from melanosarcoma. Very rarely do the thrombi become calcified.

In conclusion, I desire to express the belief that venous angiomas do not take on malignancy, but that on account of the constant irritation due to their presence the overlying epithelium may take on carcinomatous changes.

DEFORMITIES OF THE VULVA FROM EARLY AND LATE INDURATING EDEMA.

[ŒDEMA INDURATIVUM (SIGMUND); ŒDEMA SCLEROTICUM (PICK).]

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I have many times been struck with the want of familiarity of physicians with the lesions of the vulva produced by the indurating edema of syphilis. As an example of this unfamiliarity and even ignorance, I may say that I have seen instances of this affection diagnosticated as cold abscess, traumatism, elephantiasis, lymphatic infiltration, anomalous varicocele, fibroma diffusum, lipoma, sarcoma and a local anasarca, tuberculosis and cancer. While in many instances doubt and uncertainty have been present in the minds of the observers of early cases of this affection, in the study of more advanced ones a number of surgeons and gynecologists whom I have seen had not the slightest conception of the nature of the lesions before them. It seems to me, therefore, that the time is ripe for an illuminating paper on this subject.

Then, again, little has been written and little is known of the outcome of these cases and many interesting and important facts have never been published.

In this essay I shall try to describe this affection clearly in all its conditions, and then to present the details of various sequelæ in a number of my cases. My observations were made over a long period of years, during which I had the good fortune to observe a goodly

Fig. 1.—Indurating edema of left labium majus.

Fig. 2.—Relapsing indurating edema.

number of cases and in many instances to trace them in their career toward ultimate cure or permanent deformity. Most of the cases occurred in hospital and clinical practice, in women whom it was impossible to treat thoroughly or systematically for long uninterrupted periods; consequently in many of them full resolution of the syphilitic infiltration was not induced, and the affection ran a very chronic course.

CLINICAL HISTORY.

Indurating edema is in many cases a complication of the initial hard chancre, and then is an early lesion; but it may develop, owing to various causes, at later periods. It is always an expression, however, of the continued activity of the syphilitic diathesis. In some exceptional cases the initial sclerosis occupies a whole labium and much enlarges it, while in most instances the lesion is limited in extent and only occupies a segment of the part.

In a limited number of cases we find that accompanying the initial lesion, either around it or in its vicinity, a hard edema of one labium or both labia occurs. This edema, which has been called sclerotic or indurating, is very peculiar and is the sole appanage of syphilis. It usually begins insidiously in an indolent aphlegmasic manner, without pain, and perhaps with no heat nor pruritus. It may become fully developed in from one, three, to many weeks. Then again, in some cases, its onset is quite brusque and rapid, and in a few days a labium may be greatly enlarged. When such a labium is examined it may be found to be of double, even quadruple, its normal size. Its tegumentary covering may be normal in color or a little redder than usual, even violaceous, while its mucous membrane is of a dull red. In some cases the corresponding labium minus may be affected, and its pinkish-red color is then somewhat increased. There is no evidence of pitting on pressure, inflammatory engorgement nor of acute edematous swelling. The parts, as a rule, are neither hot nor tender on pressure, nor spontaneously, but in some

cases of gonorrheal or leucorrheal discharges, and owing to uncleanliness, ephemeral attacks of deep redness may be observed, which are probably due to staphylococcic or streptococcic inflammatory complications. In these cases there may be tenderness. The lesion at its acme is of an extreme hardness, sometimes presenting a dense elasticity, like the lobe of one's ear, and again a stony feel, like bone or cartilage. It may be that the whole labium or the labia (if both are involved) are thus uniformly sclerotic, or, as it often happens, there may seem to be a central kernel of great density surrounded by an atmosphere of elastic firmness. In uncleanly women, during pregnancy, and as a result of traumatism, this indurating edema may extend beyond the labial limits. Well-marked secondary symptoms are constant concomitants. This form of indurating edema, following a hard chancre, is very well shown in Figure 1. Its history is as follows:

CASE 1.—A woman, aged 26, had a hard chancre on the left of the fourchette which lasted two months. Before it finally disappeared she noticed that the left labium majus slowly and painlessly swelled. As this enlargement was going on, an erythematous and papular eruption appeared over the body. These lesions were abundant about the genitalia, and they are indicated in the dark spots scattered over the parts in the figure. By means of active treatment, general and local, the swelling of the labium was dissipated in about three months. After that the woman continued antisyphilitic treatment for nearly a year, and then thought herself well. About two years after her infection she observed that the labia minora became larger and were pushed out between the external parts. She at that time had seen no evidence of syphilis for more than a year. The hypertrophy of the nymphæ went on slowly, and in eight months they presented the appearances seen in Figure 2. They are of many times their normal size, of very firm elastic consistence, of a deep pinkish hue. The patient then showed no perceptible evidence of syphilis, and the ganglia, which in the early stages had been markedly enlarged, were scarcely to be felt. Under treatment resolution occurred.

The next form of indurating edema is well shown in the following case (Fig. 3):

Fig. 3.—Indurating edema complicating condylomata lata.

CASE 2.—A woman, aged 24, had a small and ephemeral initial lesion at the base of the left labium minus. After it had healed she noticed that her genitals became redder than normal, particularly on the left side. At the regular evolution of secondary manifestations a linear series of condylomata lata showed themselves on the inner surface of the left labium majus. As these grew in size and age, she noticed that the corresponding large lip gradually and painlessly grew larger until it became several times the size of its fellow. No heat nor sensitiveness were observed, but a condensed, unyielding labium was present, which protruded markedly downward and outward, presenting great deformity. The outlines of the superimposed condylomata are well shown in the figure.

This case, therefore, shows in an admirable manner indurating edema accompanying secondary lesions—a form which is rather uncommon.

Though indurating edema is more commonly seen in the primary and early secondary stages of syphilis, it may occur, as before stated, later in the disease—namely, in the first, second and third years, and even beyond these periods. While the indurating edema of the primary and secondary stages of the disease usually accompanies or follows the active lesions, that of the later periods may be unaccompanied by any previous or present syphilomata. Though, however, late edema may not be a complication of various late syphilitic processes, it very often seems to be developed by vaginal or vulvar irritation, and also by traumatism. I have seen cases in which irritated herpes and chronic chancroids have been the starting point of indurating edema.

The later form of indurating edema is portrayed in an admirable manner by Case 3, from which Figures 4 and 5 were taken.

CASE 3.—A woman, aged 25, syphilitic three years, had received little if any proper treatment, and in the third year of her disease she still presented a fading papular eruption and generalized adenopathies. Six months before admission to hospital she was kicked in the genitals by her husband. After the injury had subsided she noticed that her nymphæ gradually and painlessly grew large, until they presented the appearances shown in Figures 4 and 5. The left labium minus

was markedly swollen, and looked as if it contained a testis in its substance, while the right one was irregularly and less enlarged. The color of these morbid nymphæ was a deep and slightly purplish red. In consistence the left one was as hard as cartilage, while the right one was firm and elastic. The inner surface of these indurated labia is shown in Figure 4 to be nodulated and papillated, the hardening process ended abruptly at the bases of the nymphæ. The internal and local use of mercury caused slight softening in the induration.

In this case the indurating edema had its origin in the bruise of the nymphæ, the woman being in the active power of the syphilitic diathesis. It is probable that a vaginal discharge may have been a moderately accessory factor. The bruise itself became swollen and painful, and from its site the sclerosing process spread downward.

This form of indurating edema is much less common that the earlier forms, and it may also be seen on the lips of both sexes and on the prepuce of men. Typical syphilitic inguinal adenopathy is observed as a rule in these cases.

A striking case of late indurating edema is portrayed in Figure 6.

Case 4.—A negress, aged 30, became infected, and the edema began in the fourth year of the disease. The right labium majus was moderately enlarged, while the left assumed elephantine proportions. The affection developed slowly and painlessly, reaching its acme in about six months. In consistence the new growth was typical; it was exceptional, however, in the fact that the integument was covered with large and small warty and papillomatous excrescences. I removed the greater part of the left labial tumor; the parts promptly healed and, strange to say, very little deformity resulted. Examination clearly showed that the tissue of the new growth was composed of indurating edema. A number of surgeons looked on this growth as cancerous, notwithstanding the youth of the woman, while one thought it was an example of elephantiasis.

Many cases occur in which the edema is of limited extent. I have seen several of these cases in which the tumors were as large as a man's fist. Between the small masses and the very large ones there are many intermediate sizes. Uninfluenced by treatment, the lesion runs a

Fig. 4.—Late Indurating edema.

Fig. 5.—Late Indurating edema.

long and usually uneventful course. In general it may be said that if the diagnosis is made early and energetic internal and local treatment is adopted and pushed, resolution of the infiltration may be induced. Some cases, however, prove refractory. It is well to remember that if the growth is very large, and if it fails to be influenced by active therapy, it is futile to delay too long. Then the best course is surgical removal, care being taken to preserve as far as possible the symmetry of the parts.

It is very uncommon to observe spontaneous involution in indurating edema in women's genitals when the swellings have reached a very large size. Small lesions may in time undergo resorption. In the early months much can be done. I have several times been much surprised to observe partial resorption in moderate sized tumors some months after the cessation of vigorous treatment. In some cases, after the resolution of the swelling as a result of treatment, atrophic and degenerative changes took place in the labia and nymphæ.

SEQUELÆ.

The sequelæ which I have observed after the lesions are a general atrophy, with deformity; a condition similar to those of kraurosis vulvæ, epithelioma, chronic cellular hyperplasia, elephantiasis, gangrene and phagedena.

It is well to emphasize the fact that in most cases when diagnosticated early, and when promptly treated, a cure can be promised. It is the chronic untreated and badly treated cases which result in endless discomfort, misery and deformity.

In Figure 7 are depicted the external genitals of a woman, 50 years old, who had chronic indurating edema. During five years the process of obliterating atrophy went on until the appearances here shown were observed. It will be seen that the topography of the parts is no longer recognizable; the larger labia have been destroyed and the remnant of the right lesser one alone remains.

The vestibule and fourchette are absent. In this case the indurating edema also involved the perianal region, which underwent great atrophy. The result was chaotic distortion of the parts. The morbid process was not accompanied by ulceration until the atrophic changes had become very chronic. This new factor added much to the ultimate disfigurement.

In many cases, chiefly in uncleanly, dissipated women with vaginal discharges, ulceration is observed in various degrees as a result. It may be superficial, or it may lead to sinuses which perforate the urethra, bladder, vagina and rectum, and even burrow and open by fistulous tracts about the buttocks and thighs. In these bad cases phagedena and gangrene may later on supervene.

KRAUROSIS-LIKE CONDITION.

In the early days of the previous case there were appearances which suggested that form of atrophy called kraurosis vulvæ. Now it is generally admitted that this affection begins in a quasi-inflammatory manner, with pain and pruritus and hyperemia of the mucous membrane, localized at first at the clitoris and urethral orifice, and from there extending in a serpiginous manner over the whole vulva. Very soon hyperplastic and atrophic changes set in. In one of my cases coincident with the subsidence of the infiltration, atrophy gradually developed and persistently progressed. In two years the large and small labia had nearly disappeared, and looked like atrophic tissue covered with membrane which resembled cracked or crumpled parchment of a dirty brown color. The structure of the mucosa was entirely obliterated. The vulva no longer protruded; the clitoris was obliterated; and the parts around the urethra and vagina were stenosed by a leucoplakia-like tissue, which was shriveled and shrunken.

These conditions certainly were kraurotic; indeed, from my studies I am led to believe that kraurosis

Fig. 6.—Indurating edema with papillomatous complication.

vulvæ is not an affection *sui generis,* but that it develops from a number of conditions—vaginitis, vulvitis, vaginal discharges and uterine disorders. In my cases the kraurotic conditions were only remotely connected with syphilis.

LEUCOPLAKIA AND EPITHELIOMA.

Another case of mine was that of a woman, 54 years old, in whom indurating edema of the vulva went on to atrophy, with the peculiar parchment-like wrinkle of the tissues. In the vulvar sulcus a leucoplakic condition developed and lasted for several years, when epithelioma developed and in two years the growth reached the size depicted in Figure 8. In this case the early symptomatology was largely that of kraurosis vulvæ. Following the atrophy, hyperplasia of the epithelium of the vulva developed, and later on epitheliomatous degeneration set in and ultimately killed the patient. This is the only instance in which I have seen this complication follow indurating edema.

CLINICAL HYPERPLASIA OF VULVA AND ELEPHANTIASIS. CASES.

A very constant sequela of indurating edema of the vulva is simple chronic hyperplasia of the tissues (which also may result from specific ulcers). This condition is yet ill understood. It was first described by me in 1890. As a result of the involution of the specific edema the parts may become hypertrophic and more or less deformed. In these cases the chronicity of the low grade of inflammatory process seems to engraft on the tissues involved a hyperplastic tendency which thickens and more or less distorts them. The appearance in some cases is that of simple enlargements of the natural parts, but in the majority of cases there is more or less deformity and even distortion. No clear description can be given of the various cases, since the configuration of the vulva is subject to such great variation in women. In some the labia majora are large, in others small and

exceptionally absent. The labia minora are seen in an infinite number of sizes and shapes. With the thickening of the parts there is redness, mild or severe. The chronicity, even inveterate course, of these vulvar lesions is due to the structural peculiarities of the parts, to their excessive vascular and nervous supply, and to the conditions to which they are so constantly subjected, and to their dependent position compressed between the thighs. Except in the mouth and lips (and that very rarely), we do not see such persistent and deforming low grade inflammation and hyperplasia. This process is a form of inflammation with the production of new connective tissue, in which congestion and exudative products are almost, if not entirely, absent. It is really a chronic productive or chronic cellular inflammation. This lesion in mucous membranes and transitional cutaneous mucous membranes produces a new growth of connective tissue in the stroma, occurring diffusely or in the form of nodular and polypoid outgrowths. The changes are of slow growth and of great chronicity. This chronic hyperplasia of the vulva may lead to much deformity. In Figure 9 the genitals of an old syphilitic woman are well shown. It will be seen that the vulva and perineum are covered with nodular masses which have greatly disfigured the genitalia. The morbid tissues are firm and unyielding to pressure and of a deep red color. In these cases ulceration is common in the interstices between the neoplasms. This case was in reality one of hyperplastic elephantiastic hypertrophy. Its pathology, however, is very different (see below) from that of elephantiasis nostras, in which there is a mixture of lymphangitis, vascular hyperplasia and connective tissue hypertrophy, together with more or less chronic edema. The hyperplasia in old syphilitics is microscopically the same as that of non-syphilitics, and can not in any sense be considered an essential evidence of the disease.

Fig. 7.—Atrophic sequelæ of indurating edema.

Fig. 8.—Epithelioma of vulva following old syphilis.

PHAGEDENA AND GANGRENE.

Phagedena and gangrene may exceptionally occur in old women whose vulvæ have been the seat of late hypertrophic, ulcerating and infiltrating lesions. Following the metamorphosis of indurating edema these destructive changes sometimes develop, and as a result great loss of tissue is produced. In Figure 10 the ravages of phagedena are well shown. In such cases death ultimately follows these morbid conditions, but in some women healing may occur, usually with much deformity.

It may be well to remark that gummatous infiltration into the mucosa of the female genitals, as well as nodular masses in the connective tissues of the parts, may undergo ulceration and lead to much deformity and even distortion. I have seen one case of indurating edema of the vulva that was followed three years later by elephantiasis of the prepuce of the clitoris and of the labia minora. I was unable to settle the question in my mind as to whether the new growth resulted from early syphilis, or whether it was the result of chronic masturbation.

It is well to remember that indurating edema is sometimes seen in men, beginning in a chancre and involving the integument of the penis and perhaps the scrotum, and even contiguous parts, *i. e.*, thighs and abdomen. In men also degenerative changes may occur and produce more or less deformity.

PATHOLOGY OF CHANCRE AND INDURATING EDEMA.

In the primary lesion, or chancre, there is a small round-celled infiltration of the connective tissue, proliferation of the connective-tissue cells, and an abundance of leucocytes, with more or less necrosis or degeneration of its constituent cells. An uncomplicated chancre in its early stages is identical in its general structure with a small superficial ulcer or patch of granulation, except that in the chancre there is distinctly more necrosis and degeneration of its constituent small spheroidal cells.

The blood vessels surrounding the chancre, as well as those a considerable distance from the chancre, even in its earliest stages of development, are uniformly changed: the endothelial cells are swollen or proliferating; the walls of the vessels are infiltrated, and the perivascular spaces are crowded with proliferating polyhedral cells.

This early and extensive lesion of the lymph-spaces about the blood vessels, especially the smaller veins, enables us to understand more definitely how the virus of syphilis spreads, how it travels along these lymph-spaces, accompanying the vessels to the root of the penis, to the first set of lymph-nodes which such a set of perivascular lymphatics communicate with—namely, the inguinal ganglia. From these inguinal nodes the cell proliferation, in response to the syphilitic virus, is propagated, it would seem to the lymph-nodes in general throughout the body in greater or less extent, and in this way the general adenopathy is established.

This extension of syphilis through the perivascular spaces from the primary sore to the inguinal glands occurs very early and proceeds with great rapidity. As soon as the chancre appears the network of peripheral perivascular lymph-spaces is already involved, and, as indicated by the line of proliferating cells along the venous lymph-spaces, the virus is already on the path to the inguinal lymph-nodes.

The stage of *induration* or *indurating edema* can now be considered. If a chancre at the well-pronounced stage of induration be examined microscopically (Fig. 11), it will be seen that the semi-necrotic mass of small spheroidal cells composing the bed and main bulk of the ulcer is circumvallated by a zone of edema and cellular infiltration of the papillary portion of the derma (Fig. 11, *x, x, x*). Indurating edema, then, as the name implies, is really a wall about the chancre wherein the interfibrillary spaces of the pars papillaris are distended with fluid and small round cells (Figs. 11 and 12).

Fig. 9.—Chronic hyperplasia of vulva and perineal region from late syphilis. Further development of such cases are termed by some authors elephantiasis.

Fig. 10.—Phagedena of genitals of female following indurating edema and ulceration.

To recapitulate briefly the series of changes in a chancre: When the causal agent of syphilis enters through the skin or mucous membrane, it excites local leucocytosis and exudative inflammation, with more or less necrosis; there are also proliferation of the connective tissue cells, a propagation of proliferating cells along the perivascular lymph-spaces, and later a wall of infiltration and edema of the upper corium layers formed about the periphery of the ulcer corresponding to the stage of indurating edema.

In the light of these studies it is easy to understand cases of early indurating edema symptomatic of active

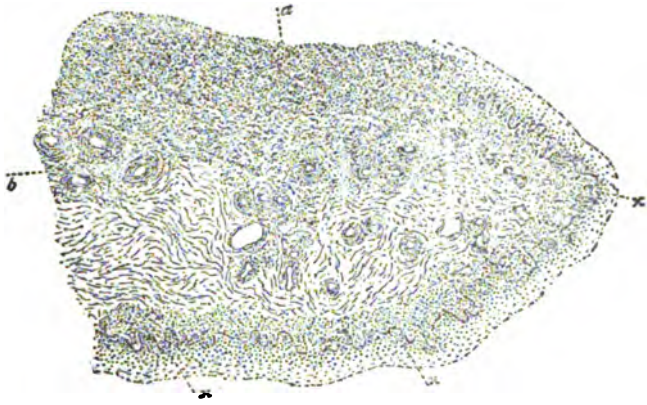

Fig. 11.—Section of preputial chancre. The indurating edema is shown by a distension and infiltration of the upper layers of the derma, shown in the zone *x*, *x*, *x*, about the center of the chancre at *a*. The infiltration of the wall of the vessels is clearly shown, especially at *b*.

primary or early secondary infection. The cases which puzzle us are those in which traumatism and various phlegmasia of the genitals seem again to set up this sclerosing process. The pathogenesis of these later cases is yet to be worked out.

PATHOLOGY OF CHRONIC HYPERPLASIA OF THE VULVA.

In chronic hyperplasia of the vulva, as the name implies, there is also a productive inflammation, a development of new connective tissue through the agency of

the connective-tissue cells of the derma. The connective tissue cells proliferate and, lengthening out, become fibroblasts; the fibroblasts in turn are slowly converted into new fibrils of the derma, so with each division and focus of connective tissue proliferation the ground is laid for a future addition to the fibrillar substance of the derma. The process is exceedingly slow, and takes place by small increments; that is, groups of connective tissue cells in certain portions of the vulvar regions proliferate

Fig. 12.—Same section as in Fig. 11 more highly magnified. The inter-fibrillary spaces of the upper layer of the derma are distended with fluid and small round cells.

and become the forerunners of new connective-tissue fibers. This may go on simultaneously over quite an extent of the vulvar region, and in the course of time produce more or less evenly a hyperplasia about the pudendum, or it may be limited and accentuated in some one particular spot and give rise to localized fleshy tabs, excrescences and nodules. Between the two sets and forms of this activity of the dermal cells and their com-

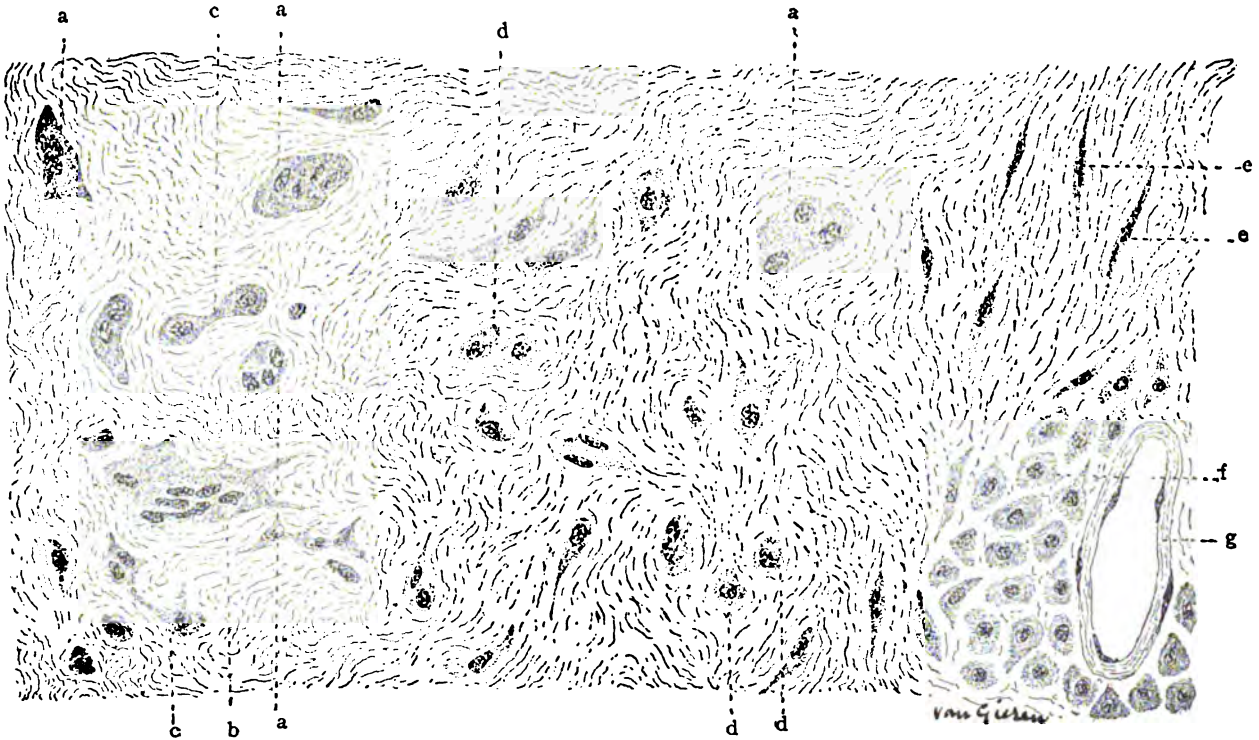

FIG. 13.—Section of a cellular hyperplastic patch following syphilis of the vulva; *a, a, a,* stages in the formation of a giant cell, *b*; *c. c.* connective tissue cells apparently in stages of division and proliferation; *d, d, d,* plasma cells; *e, e,* young fibroblasts developed from the proliferating connective tissue cells; *f.* a group of small polyhedral cells which, to a large extent, are plasma cells, and possibly to some extent are swollen small lymphocytes distending the lymph space; *g.* a small vein (Zeiss 1/12, oil immersion, ocular, 4).

binations are such a variety of intermediate gradations as to well merit the characterization of protean. But this should give rise to no confusion or temptation to classify them into different diseased processes, since however great the external configuration and apparent differences in their aspect, the underlying process is one and the same.

As a particular illustration of this process of chronic cellular inflammation of the derma Figure 13 may be consulted. This shows nearly all of the phases of connective tissue cell proliferation. And it also shows the participation of plasma cells, and possibly small lymphocytes, especially in a lymph crevice about a small vein. The obscure origin and differences of these latter cells do not concern us, as their destiny is much the same for all —the increase of connection in the derma, namely, hyperplasia.

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DISCUSSION.

DR. JOSEPH ZEISLER, Chicago, stated that what little he has seen of kraurosis vulvæ did not suggest at all a hyperplastic condition such as Dr. Taylor described. Kraurosis seems to him to be more closely allied to atrophy, and apparently has no clinical relationship to the condition described in the paper.

DR. WILLIAM A. PUSEY, Chicago, said that in the last year he has been able to study two cases of kraurosis vulvæ in elderly women, each with a history of long-standing, superficial atrophy of the labia, with patches of leucoplakia of the mucous membrane, such as are seen in the mouth. In both of these epitheliomata had developed on the leucomatous patches. Dr. Pusey has never seen any atrophic conditions of the vulva that were the result of previous hyperplasia, but he can readily see how some of the cases might have that etiology.

DR. WILLIAM S. GOTTHEIL, New York City, declared that in the City Hospital in New York more of these cases are seen than in most institutions in this country. He has seen some cases that were hypertrophic and others that were atrophic followed by sclerotic lesions, such as Dr. Taylor described. He thinks that the processes are identical. Connective tissue hyperplasia in the later stages shrinks and becomes atrophic. The photomicrograph which Dr. Taylor exhibited showed a very late stage of an intense inflammatory process, such as might follow sclerotic or ulcerative processes of various kinds.

DR. R. W. TAYLOR, New York City, in answer to a question by Dr. Baum, stated that the disease, as he saw it, was a sequel of syphilis, and of syphilis alone. In his cases the extension of the edema was coincident with the hard chancre. In some cases of progressive syphilis, in which the diathesis is still active, the edema sometimes occurs from simple lesions, sometimes from condylomata lata or from the hyperplasia set up by staphylococcic irritation following vaginal discharges. Dr. Taylor recalled the fact that his paper was divided into two parts: The first dealing with hyperplasia and the second with its sequelæ. He does not claim that the

cases reported were cases of kraurosis, but that they resemble that condition. Case No. 7, he declared, was one of the most typical he has ever seen, the patient's vulva resembling a rubber tobacco pouch. All these cases occurred in his service at the Charity Hospital, many years ago, and were carefully observed for a long time. In every case sections were removed and submitted to Dr. Ira Van Giesen for microscopic examination, and his findings were verified by Drs. Prudden and Delafield.

TEN YEARS EXPERIENCE IN THE TREATMENT OF SYPHILIS BY THE INTRAMUSCULAR INJECTION OF INSOLUBLE MERCURIALS.

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The dangers of a premature judgment of the value of a therapeutic method is abundantly proved by the experience of the past few years, and should warn us that excessive optimism may be as harmful as the therapeutic nihilism that was formerly the fashion. Tuberculin, for instance, went up like a rocket and has come down like its stick. The erysipelas toxins cured many diseases at first, but seem now to have lost much of their efficacy. The Roentgen rays were but yesterday the vaunted and unfailing remedy for all manner of recalcitrant affections; to-day they are a therapeutic agent of increasingly limited applicability, and with disadvantages and dangers to which the many suits for damages from burns are attracting medical attention. Conservatism of statement and a judicious reticence are often more valuable than careless optimism.

It is, therefore, only during the last two or three years that I have said much in public concerning the method of mercurial administration in syphilis that is the subject of this paper. I have used it, however, steadily and almost exclusively, both in public and in private practice, since early in the nineties. In three hospitals

in New York it has been the regulation treatment during my terms of service, as also in the various dispensary services that have been under my control. It is safe to say that almost all those who have had opportunity to witness its administration and effects—internes, assistants and visitors—have become its enthusiastic advocates, and its reception by the profession at large during the last two years has been not less cordial. I have even had the satisfaction of hearing many of our older leaders in syphilography state that they have always advocated and employed the injection treatment. For the method is not new, but old; Scarenzio, as long ago as the middle of the last century, injected calomel to cure the luetic disease.

On the basis, then, of a not inconsiderable experience extending over a term of years, I feel justified in publishing the conclusions to which I have arrived. I shall not attempt to give figures as to the number of cases treated or injections administered. Using the method daily, as I do, as a part of the regular office and hospital work, and without any special intentions of publication, such records would be difficult to collect. I average two or three injections every day in private work, and I can safely say that, either personally or under my direction, between one and two thousand injections have been given annually for a number of years past. The conclusions hereinafter detailed are, therefore, neither theoretical nor the result of isolated observations; they are the epitome of daily experience for a long time past, in all manner of patients and under all kinds of conditions.

It is, of course, with the usual ingestion method of administering mercury that the intramuscular injection method must compete. Inunctions have never obtained the vogue here that they have had, and still have, in Germany; they have practically been rejected here as being too troublesome and too offensive for routine treatment. Other methods, such as fumigations, baths, mercolint pads, etc., are either special methods useful only

in isolated cases, or therapeutic curiosities that have never obtained any general professional indorsement.

The very first questions to be asked are, therefore, these: Is the method any better than the ordinary one? And if so, are its advantages sufficiently great to warrant the regular employment of a treatment that is a little more troublesome than writing out a prescription? And then follows the query: Should it be used as the regular treatment in all our cases of syphilis? My answer to all three questions is, unhesitatingly, yes; and it is based on the considerations that follow.

The rapidity of action of the drug when administered hypodermatically is surprising, especially on the earlier and acuter manifestations of luetic intoxication. The patient suffering from violent cephalgic or osteocopic pains obtains relief in a very few hours; in fact I have had patients repeatedly affirm that they have felt the good effects of the injection on subjective symptoms of this kind in an hour or two. Objectively there distinct signs of improvement by the second day, or, at most, by the third; general eruptions commence to fade, and broken down lesions, primary, secondary or tertiary, show decided marks of retrogression.

On the later lesions the action of the drug when administered in this way is, of course, somewhat slower, but it is still very much more rapid than when given by the mouth. Gummatous infiltrations of the skin and subcutis, periosteal and bone affections, etc., usually show distinct betterment in a few days and after a single injection. A point of prime importance is the fact that the more obstinate and relapsing of these later manifestations, such as the palmar and plantar syphiloderms, mucous patches, etc., react, and sometimes with surprising rapidity, though they may have proved entirely recalcitrant to mercury administered by the mouth or even to inunctions. Thus I have under my care at the present moment a physician with a very obstinate unilateral plantar squamous lesion, on which mercury by

the mouth to any amount, and inunctions to any extent, have no effect at all; yet which commenced to improve at once under the injections. It is worthy of note in passing that this case is the only one that I have encountered in which the patient, before he decided to place himself in my care, administered the intragluteal injections to himself.

As to the employment of the injections in such probably specific affections as tabes and general paralysis, in which Laredde has reaped such promising results, I have little satisfactory to say. These cases generally remain in the hands of the general practitioner or the professed neurologist. Of the few that I have treated some have improved for a time, but I can not claim to have obtained the marked and permanent betterment noted by the French authority.

An important factor in estimating the efficiency of a syphilis treatment is the frequency of the occurrence of what the Germans call "relapses;" does the intramuscular injection of the insoluble mercurials afford any greater certainty of the non-reappearance of active symptoms than the ordinary methods? It is my positive belief that it does. The regular and usual course of the disease—and I make this statement on the basis of private cases that have been carefully watched through the entire three years and more of treatment—is that when once the patient is under the full injection doses there are no further disease manifestations at all. In many cases, and especially when vigorous treatment is begun early, there is a rapid subsidence of the active symptoms, and from then on apparently perfect subjective and objective good health. Joint pains, cephalalgia, pharyngitis, alopecia, etc., are slight and fugitive, if they appear at all, and they yield very readily to a slight increase in the intensity of the medication. The more serious late secondary manifestations, the tubercular and pustular syphiloderms, extensive pharyngeal lesions, iritis, etc., are practically not seen at all in private and

carefully treated cases. My records show only one noteworthy exception in which a serious outbreak occurred while the patient was under vigorous treatment. This was in a physician in whom a most obstinate and relapsing iritis persisted during the entire first year and a half of the disease, and which long resisted all the remedial measures that a well-known ophthalmologist, who cared for the case with me, and I could apply. Here I think that the unfavorable influences of overwork and worry, together with the somewhat insufficient treatment caused by the necessarily irregular life of a busy general practitioner, were the direct occasions of the failure. I am fully aware of the fact that the type of syphilis that we see to-day, especially in private practice, is much less malignant than it used to be, and yet the almost complete absence from my records of any of the commoner severer complications of the early luetic infection is noteworthy. So much is this the case that the main practical difficulty that I have found with the treatment has arisen from the fact that it becomes hard, after a time, to convince many patients who feel perfectly well that there is still anything the matter with them and that they still need treatment.

As regards the "relapses" which we class as tertiary in ordinary parlance, we know that they occur in only a small proportion of all cases, and in a still smaller proportion of those that have been properly treated. I do not think that more than 10 per cent. show them, though figures varying from 4 per cent. to 40 per cent. are given by various authorities. Of course no individual observations in a restricted clientele, and for a moderate term of years, can have much weight on this point. I can only say that I have not seen any tertiary manifestations at all in the comparatively few cases that I have had occasion to follow up.

Practically the same is true of hereditary transmission. A number of my cases have married; some have had children. In a few very careful cases the father has

been put on a renewed course of treatment during the first year of his married life, and I have treated one or two wives of my old syphilitics during the first gestations, by mouth, and, of course, without their knowing the object of the medication. Neither in these cases nor in the others that have had no subsequent medication has anything occurred to point to persistence and hereditary transmission of the virus. I believe that these patients are safer from dangers of this kind than are those who have merely had the ordinary ingestion treatment. It is certainly rational to assume that a treatment that so quickly removes all evidences of active luetic poisoning, and that so radically prevents the supervention of the usual and more immediate sequelæ of the disease, is just as effective in hindering its hereditary transmission.

Turning now for a few moments from therapeutic to more purely personal considerations, my experience has been almost uniformly to the effect that the patients become ardent advocates of the treatment as soon as they become convinced of its easiness, painlessness and efficiency. They greatly prefer medication that is administered by the physician at not too frequent intervals to one that involves the taking of pills or medicines several times each day. A busy man of affairs is very liable to forget his medication, especially when he feels well. A visit to the doctor's office every ten or fourteen days is a far smaller tax on the patient's memory and time. Besides this the treatment subserves the important consideration of secrecy. Many luetic cases very properly desire to conceal the fact of their affliction from their friends and relatives, and this is difficult to do when medicines must be taken several times a day for long periods of time. On the other hand, an occasional visit to the doctor for medication need excite no notice, and if it does it can be explained. And the treatment, once administered, leaves no trace behind. The loudest in their praises of the method are those who have ex-

perienced the inconveniences and the disagreeableness of the other medications.

Properly administered, the injections are almost painless. If the right site in the depths of the gluteal muscles is selected, the skin made thoroughly cold with ether, the puncture and the needle withdrawal made with rapidity, though the actual injection of the suspension be done slowly, the pain is an entirely negligible factor. The gluteal skin is not very sensitive, and my experience is that women stand the injections even better than men, possibly on account of the comparatively large size of these muscle masses in the female sex and the abundant fatty layer that covers them. The exceptions to this are few. Once in a long time one finds a male whose glutei are so small, and whose panniculus is so poorly developed, that it is difficult to get a tissue-mass suitable for the puncture. And exceptionally also one meets one of those neurotic and hyperesthetic individuals who faint on the incision of an acne pustule, and who will complain of suffering greatly from the injection. Both these classes, however, do not in my experience make up more than 1 or 2 per cent. of all the cases treated.

A certain amount of discomfort is felt in the glutei for twenty-four to forty-eight hours after the injection. Its amount varies greatly, of course, with individual susceptibility, but there is no real pain, the patient feeling as if he had received a bruise or kick. It wears off rapidly, and in three or four days there is usually no tenderness even on deep pressure on the spot. The great majority of patients do not mind it at all; many of them, in fact, make no spontaneous reference to it at their next visit.

It is, of course, of the greatest importance for the patient's comfort that the injection should be done properly, and a quick plunge of the needle through the chilled skin and into the depths of the muscle is essential. A hesitating, slow or boring insertion is bound to

be painful. Still more important is the selection of a proper site for the operation. It is not wonderful that a patient that I saw a few days ago complained that the injections that his physician had given him had been very painful and had confined him to the house. They had all been made exactly over the great trochanters on each side, in a place where there was hardly any muscle at all, where the foreign mass was inevitably deposited under dense and resistant fascial structures, and where the slightest motion of the thigh disturbed the injured tissues.

Indurations after the injections do not occur, as a rule. They do no harm, and only betoken a slow rate of absorption of the injected material with a rather excessive reaction of the tissues; they are indications, other things being equal, for diminishing the frequency or the amount of the injections. I sometimes prefer on this account to give a 5 or 6-drop injection weekly, rather than one of double the size at fortnightly intervals. Abscesses are, of course, due to faulty technic, and I have found them, even in the hospital and dispensary work done by internes and assistants, very rarely, indeed. I have had the only one in years in my private work this winter, and in this case circumstances compelled me to make a hurried injection and the patient was very uncleanly.

A word as to the danger of embolism of the lungs after the injections. I believe it to be almost illusory. I have never seen it occur, and in the cases that have been recorded the symptoms have been fugacious and recovery has been rapid. It is difficult to see how it can possibly occur if the precaution that I invariably employ and insist on, of disconnecting the syringe after the needle is introduced into the tissues and watching the lumen for a few seconds before making the injection, is carried out. There is evidence of entrance of the point of the needle into a vein in perhaps one out of twenty-five punctures. This merely entails the with-

drawal of the needle and its reinsertion in another spot. The traversing of veins, as shown by the oozing of blood from the puncture after the needle is withdrawn, is of no moment at all and requires only a little pressure to stop it. I have recently had the unique experience of entering a vein in two successive punctures and having to make a third one; luckily it occurred in the person of a physician and required but little explanation.

The possibility of mercurial poisoning is of greater practical importance. Theoretically the deposition of a considerable amount of mercury in the tissues where a minor surgical operation would be required to remove it would seem to be a procedure that might, in some cases, have unpleasant consequences. A special idiosyncrasy to the poisonous effects of mercury does occur, and intoxication may happen as it does from the ingested and inuncted drug. As a matter of fact, however, the drug injected into the muscles seems very much less prone to cause the salivary, gastrointestinal and nervous symptoms of mercurial saturation than when given in other ways. Once in a while I see very mild symptoms of the kind, which subside under the ordinary measures and do not call for any special measures. On the other hand, I have several times given as much as 20 drops of the suspension, or 2 grains of the salicylate of mercury weekly, with rapid absorption and only beneficial effects. In a very few cases I have seen severer intoxication arise. These, however, have either been cases in which the severity and danger of the local lesions have been such as to necessitate and justify most intensive medication, whatever the mode of administration, as when a gumma of the palate has been on the point of breaking through and causing a perforation, or they have occurred in hospital cases in which the injections have been given with the usual routine recklessness of the average staff man. In no case have I found it necessary to cut down on the induration and remove the mass. In all cases, however, when I

begin treatment, and the individual reaction of the patient to the drug is unknown, I begin with a small dose, only going up to a full one when I am convinced that it is safe to do so. The exceptions, of course, are the luetic emergencies; when there need be no hesitancy to take the slight risk of a possible intoxication to save the integrity of an important organ or prevent the extension of a specially destructive process.

I need say but little to this audience of the advantages of the injection method of treatment from the personal standpoint of the physician. To conduct the treatment yourself and to control it is certainly better than to leave it practically in the hands of the patient and his druggist. A certain proportion of patients, even in private practice, will neglect themselves after they have remained in apparent good health for a time, but their number is very much less when they receive a definite treatment at regular intervals from their medical attendant than when they are permitted to administer it themselves. The great majority of private patients remain under steady treatment for the prescribed three years. In public practice, of course, the conditions are different. The patients appear for treatment only, as a rule, when symptoms trouble them, and then they often ask for the injections that have done them good before.

DISCUSSION.

DR. ROBERT W. TAYLOR, New York City, said that he had always been unalterably opposed to the intramuscular injections of insoluble mercurial salts in the treatment of syphilis, for he regards the method as unscientific, mutilating, uncertain in effect and more or less dangerous to health and even life. He cited many cases from literature in support of his contention that the method is unsafe and unwise.

He said he had used the hypodermic injection of bichlorid of mercury and the bicyanid of mercury in water unremittingly since 1871 (The Treatment of Syphilis by the Hypodermic Injection of Corrosive Sublimate, *Medical Gazette*, May 13, 1871), and whereas at first he advocated it as a treatment of reserve utility and exigency, he now looks on it, in many cases, as highly valuable for routine and methodic treatment, and one of our best measures in general and chronic mer-

curialization. The idea that watery mercurial solutions pass very rapidly through the system and then leave the patient unmercurialized is a delusion. One or two injections will show chemical traces for a week or two, sometimes for much longer periods. After a course of injections, mercury may be found in the urine for several months.

Intramuscular injection of insoluble mercurials is a method utterly unscientific, mutilating, wholly unreliable as to therapeutic effect, and very often is a menace to limb and life. Absorption of these injections is absolutely a matter of haphazard; we have no control over them whatever. In some cases absorption may occur promptly and produce alarming symptoms, or the injections may become encysted and thus remain for months or years. They really act as foreign bodies. In one such instance, a blow on the buttocks after an injection made several years before produced such an explosion that embolism, stomatitis, general fever and emaciation promptly developed, and if the injected area had not been deeply incised, scraped and cauterized with white heat, the patient would have lost his life The incompatibility of the tissues, subcutaneous or muscular, to insoluble mercurial salts and oily menstrua is well attested by the experience of many observers in thousands of cases; therefore, these injections should never be risked. We can get all necessary mercurial action without injury by means of soluble mercurial salts injected into the connective tissues. Why, then, should we be guilty of surgical vandalism? In all probability, hundreds of damage suits would have been instituted throughout the whole world for injuries inflicted by these intramuscular injections had it not been for the shamefacedness of patients in complaining, and acknowledging that they were victims suffering from syphilitic infection. (Verb. sap.)

Dr. A. Ravogli, Cincinnati, said that he agrees with Dr. Gottheil in saying that to the genius of Scarenzio the world is indebted to a new era in the treatment of syphilis. The injection method has entirely changed the treatment of syphilis. In a great many cases, in spite of all the remedies by the mouth or by the skin or by fumigation, no benefit will result, while, after a few injections, there will be an entire change in the aspect of the disease, even in its most malignant form. Following the teaching of Prof. Manassei, he was among the first to try the injection of calomel in syphilis. The calomel was mixed with a little water and mucilage of gum acacia, and injected in quantities as high as ten grains, then gradually diminishing the dose. The injections of calomel were at times followed by unpleasant consequences, such as diffused abscesses and severe stomatitis; still, in severe cases of syphilis, where the vascular system or the eye, or some equally important organ is threatened, the disease will be seen to yield rapidly to this remedy. Subsequently, he used

injections of a 1 per cent. solution of bichlorid of mercury. Good results were obtained from this method, better than from the cyanid peptonate or other mercury salts. He continued this method of treatment for a number of years, but does not consider the action of the solution of mercury bichlorid as satisfactory as that of the insoluble salts and much more of the metallic mercury. Since he adopted the method of Lange, which is the use of gray oil by the injection method, he has obtained splendid results. When it is better known how the spirochætæ get inside the tissues there will, perhaps, be some explanation of why, with soluble solutions of mercury, we do not get the permanent action that we obtain from the gray oil. The mercury in those cases seems to act, not as a mercury salt, but probably as metallic mercury, and these metallic granules, reduced to their most minute size, probably affect the germs of syphilis and eradicate them. Dr. Ravogli said he is not a firm believer in the efficacy of the soluble salts.

In cases of tertiary syphilis with bone lesions he does not think that mercury exerts the powerful effect that it does during the earlier periods of the disease. In those cases he thinks we must depend on the iodin preparations much more than on mercury. In some of those cases the patients will not tolerate iodid of potassium or sodium by the mouth, and under those circumstances he gives iodipin, a preparation of iodin and sesame oil, one syringeful hypodermically every other day. He has found this method very efficacious in late bone lesions. If he wants to introduce mercury into the blood he resorts to intravenous injections, but he believes that mercury, properly used, should be introduced into the system through the lymphatics, and that there is the place to find the spirochætæ, and to neutralize the poison of syphilis.

Dr. Joseph Zeisler, Chicago, said that he has given thousands of injections in syphilis during the past twenty years and over, exclusively of the soluble salts of mercury; never of the insoluble ones. He had not the slightest doubt concerning the accuracy of the statements made and of the brilliant results of the treatment obtained by Drs. Gottheil, Klotz and others; but so far he has never been called on to resort to any more energetic method of treatment than that which he now employs. Enthusiastic statements, like those of Dr. Ravogli may perhaps lead to the impression abroad that we have in this method an unfailing weapon for the radical and permanent cure of syphilis. We should never lose sight of the fact that our treatment of syphilis is purely symptomatic, and he challenges any one to affirm that he can prevent relapses, whether by the injection-method or any other. If, by the use of the insoluble salts we could prevent relapses and do away with locomotor ataxia and other late evidences of syphilis, Dr. Zeisler said that he would be glad to adopt that

method of treatment, but as the matter stands, he agrees entirely with Dr. Taylor, and he feels that one serious accident with this method could not be compensated for by all the good results obtained by it.

Dr. Granville MacGowan, Los Angeles, Cal., said that he had seen most excellent results from the injection method of treatment in many cases where the administration of mercury by the mouth, although not contraindicated, was not practicable. Like Dr. Zeisler, he has been deterred from using the insoluble salts by a knowledge of what has happened to others. In patients who are able and willing to take care of themselves, syphilis is never, practically, a fatal disease. Outside of our great hospitals, with patients who are the victims of alcohol and drugs, and who are intensely anemic, it is rare to see the deformitive kinds of syphilis which were common twenty-five years ago. He has time and again seen people recover from syphilis, get well and do well, when the mercury was taken away from them, and he has also seen people take mercury to the limit without any resulting improvement. In those cases he has found, on making a blood count, that the patients were always excessively anemic, and the first thing to do is to take away the mercury and put them on good food, plenty of fresh air and baths, and the peptonate of iron with manganese. In dealing with a case of syphilis of a malignant type, or in certain emergencies, Dr. MacGowan sees no objection to the use of one of the insoluble preparations of mercury, and for that purpose he would certainly prefer the salicylate.

It makes some difference as to how the mercury is given; whether it is given alone, or in connection with the other drugs. He had in mind two patients, both physicians, who were unfortunate enough to acquire syphilis many years ago. The disease was apparently easily controlled at the time, but it has since recurred in the form of grave bone lesions. In one of them, about two-thirds of the medullary canal of one tibia has been obliterated. Both have taken large doses of potassium iodid, and both have received mercury by inunction. Dr. MacGowan wished to direct the discussion a little toward what would relieve or cure late syphilitic lesions of this kind. These two men are well worth saving to the profession, and if the injection treatment advocated by Dr. Gottheil and others will benefit them, he would be glad to know it. An assurance of that fact would be a personal kindness to him and his clients, as well as to many who depend on these men in their work.

Dr. H. G. Klotz, New York City, said that he has used the injections of the insoluble preparations of mercury for 25 years, and he can confirm everything that Dr. Gottheil has said in regard to the superiority of this method of treatment over others. For a number of years before he tried the injections

of the insoluble salts he used the soluble salts by the injection method, and he can positively say that the former are the more effective. He has seen them effective in cases of late syphilis of the viscera or brain where the bichlorid of mercury and similar salts had failed.

One of the advantages of the use of the insoluble salts is the almost entire absence of affections of the mouth following their use. Why that is so he can not say, as he uses scarcely any precautions to prevent them in his private practice. In fact, he has seen an ulcerative stomatitis heal under injections of the salicylate of mercury. Dr. Klotz said he can not understand why the use of the insoluble salts by injection should be termed an unscientific method. Is it more unscientific than the inunction method? He does not think so, nor does he regard it as dangerous as some of the speakers would have us believe. At the same time, he would not say that it is as free of disagreeable effects as Dr. Gottheil has said. Pain occasionally follows the injections to a moderate extent; it is remarkable that some patients invariably experience some pain on one side of the body, while injections made on the other side are absolutely painless.

He has seen syphilitic affections of the bones quickly cured by salicylate injections. He has seen a prominent tophus of the frontal bone disappear after two such injections. This method of treatment may not do good in all those cases, and we have still another old remedy to fall back on, and that is any good preparation of sarsaparilla, which does good sometimes, particularly in those who have taken much mercury. Under its use, he has seen cases yield that have resisted all kinds of inunctions and injections.

DR. L. E. SCHMIDT, Chicago, said that after ten years' experience with the injection method of treating syphilis, and after having had ample opportunity to use both soluble and insoluble remedies and the different methods of giving the same, he wished to state that he agrees with the views of Dr. Zeisler. He now practically restricts himself to the use of the soluble salts. For a number of years he made injections of gray oil, calomel and the salicylate of mercury, but he has come to the conclusion that there are dangers which no one can avoid in connection with the use of these insoluble salts With the soluble salts these objectionable features are rarely met.

DR. M. B. HARTZELL, Philadelphia, said that from the general tenor of the discussion one might suppose that the treatment of syphilis by the use of mercury by the mouth had fallen into "innocuous desuetude," yet we all see a large number of cases of syphilis get well under the use of mercury by the mouth. He is of the opinion that the injection method should be limited to those cases in which for some reason, it is impossible for the patient to carry out the ordinary treat-

ment, or in cases where there is extreme urgency, as, for example, when the disease attacks the central nervous system. He said that he is unalterably opposed to the injection of the insoluble salts. After such an injection, the drug is beyond control. It may be absorbed gradually, with good results, or it may be absorbed *en masse*,, with danger to the life and health of the patient. There are many cases where the inunction method can be employed to advantage, and in the vast majority of instances it accomplishes everything that mercury can acomplish in this disease. The drug we give is mercury, whether it is taken by the mouth, rubbed into the skin or injected. The injection method requires frequent visits to the physician's office, and in many instances the injections are extremely painful. He wished to emphasize the fact that the vast majority of the cases of syphilis can be cured by mercury taken either by the mouth or by inunction. He said that Jonathan Hutchinson years ago pointed out that potassium iodid is one of the rare drugs which in small doses is often as effective as in large ones. He has seen large tubercular syphilids disappear under one grain doses of potassium iodid, three times daily.

DR. JAY F. SCHAMBERG, Philadelphia, said that he is in complete accord with Dr. Hartzell. He fully agrees with what has been said regarding the value of the hypodermic treatment as a reserve measure. He has had a small experience with this method, having given about five or six hundred injections, but has limited himself to the use of the soluble mercurial salts. He believes that the number of cases of stomatitis produced by mercurial injections is considerably less than by mercury administered by the mouth. He never sterilizes the needle beyond immersing it in a 10 or 20 per cent. solution of carbolic acid in olive oil after each injection. A small cylindrical jar with a perforated aluminum plate is used for the purpose. He has not found it necessary to sterilize the needle further, and the injections have never produced anything beyond the ordinary inflammatory nodulation. By immersing the needle in oil, it remains untarnished, even though kept for months.

DR. JOHN A. FORDYCE, New York City, said that he is not an advocate of any routine method in the treatment of syphilis. He employs hypodermic medication, inunctions, and mercury by the mouth. In certain cases where the injection treatment has failed to prevent relapses, he has had success with the internal treatment. The objections to the use of the insoluble preparations by injection are generally the result of faulty technic, or are theoretic. He has the same hospital service as Dr. Gottheil, and has never seen an abscess produced by the injection of an insoluble preparation of mercury, nor has he seen any cases of severe ptyalism or any other serious symptoms, and he has come to regard the objections to that

method as largely academic, and that the accidents that have been reported following these injections were due to a lack of proper precaution. The fact that we only employ these injections of insoluble salts every fifth, or seventh or tenth day is an argument in favor of their use in preference to the soluble preparations, which must be given every day, or every other day.

DR. WILLIAM H. DAVIS, Denver, said that the use of intramuscular injections should be limited to cases where we do not get the desired effect from internal medication. He has used both the soluble and insoluble preparations of mercury, and the injections are not entirely painless. When a rapid effect is desired, the intramuscular injections or inunctions or the old bath method are most efficacious. With internal medication we sometimes make the mistake of using one preparation too long. He believes there develops in most cases a systemic toleration to a single remedy. As a rule, he changes the preparation about once in thirty days, and thus gets along with a smaller dose.

DR. WILLIAM T. CORLETT, Cleveland, Ohio, said that in the treatment of syphilis the method easiest to administer and most agreeable to the patient is the best. He is not a firm advocate of any one method. In the majority of cases the administration of mercury by the mouth is best, because, as a rule, it is the easiest and most agreeable to the patient. The inunction method is a good one, but is open to objections. The injection of the soluble or insoluble salts of mercury is likewise good, but also has its disadvantages and should be resorted to in certain cases that will not respond well to other methods. He has no objection to the injection method, the main obstacle is the difficulty of getting patients to submit to it. In selected cases he has given the insoluble salts of mercury, especially the salicylate, for many years with excellent results, and in not a single instance has he seen an abscess follow. The injections are followed at times, however, by a certain amount of discomfort, amounting sometimes to pain for a few days.

DR. L. DUNCAN BULKLEY, New York City, said he has had to do with syphilis for thirty or forty years, and during the past ten years his first assistant at the New York Skin and Cancer Hospital has been an urgent advocate of the injection method. He has watched his assistant's cases, and has watched his own, and at the clinic there patients have been shown that were treated by both methods. From the result of his observation, he is not at all convinced of the desirability of the hypodermic use of mercury in syphilis, nor does he consider it preferable to the internal method, providing the drug is properly administered and given with the proper adjuvants, commonly iron. In the presence of syphilitic lesions, he almost always uses potassium iodid. At the hospital, in-

jections have been used in many cases, both of the soluble and insoluble salts, and there have never been any abscesses or other untoward results. The preparation used there is the salicylate. He has never seen any amount of salivation or other unpleasant effects, but in spite of that he believes that he can handle a case of syphilis with satisfaction both to himself and the patient by limiting himself to the internal use of mercury and iodid of potassium. At the same time, he looks out for the general condition of the patient; not simply giving him mercury because he has syphilis, as is so often done, but regarding him as a human being who has syphilis and may also have other ailments. In spite of all he has seen and read, he is not inclined to adopt the hypodermic method of treating syphilis as a routine practice.

DR. W. S. GOTTHEIL, New York City, called attention to the fact that the bad effects of the treatment, of which Dr. Taylor cited instances, were in cases treated years ago, when aseptic precautions were not taken, and when accidents occurred in many similar operations.

DR. TAYLOR said that some of the cases he cited were reported as late as 1903 and 1904.

DR. W. S. GOTTHEIL said that accidents, of course, are liable to occur in some cases, no matter how the mercury is given. Deaths have occurred from the administration of mercury by the mouth in more than one case, and instances of intense salivation by that method are not infrequent. As to the ease with which the injections are given, with him they are a matter of daily routine. The method is not an experimental one; on the contrary, it is older than many of us here. If some of us say that the method is difficult, or that patients object to it, while others say that it is simple and that patients do not object to it, we are simply giving our own experience. It is especially in the obstinate tertiary and relapsing types of syphilis that the injection of the insoluble salts show their good results. He does not know of any other method by which we can prevent the rupture and extrusion of the contents of a gummatous osteitis or a gumma of the palate, and in reply to Dr. McGowan he assured him that if anything can heal these late bony lesions, it is this injection method of the insoluble preparations of mercury. Dr. Gottheil said that his paper dealt only with the administration of mercury. He has found injections of the soluble mercurials extremely effective, but his objection to them is that they are more painful than the insoluble, and that they must be repeated with great frequency—every day or every other day. Patients will not submit to this, and he does not blame them. One of the chief advantages of this method of treatment is that the injections are only necessary at lengthened intervals.

SIGNIFICANCE AND TREATMENT OF ITCHING.

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Itching, or pruritus, is an unpleasant sensation which most individuals have undoubtedly experienced at some time, and yet which it is difficult to describe, any more than pain can be described. But all recognize and know that as a sensation in the skin it may be very disquieting, and that it is one often urgently calling for relief; at times also it may be so distressing that the sufferer will submit to almost anything in order to be freed from it, and will frequently claim that any amount of pain would be preferable.

Nature's treatment of itching is by scratching, and in the effort to get relief from intolerable itching animals and human beings, the latter especially, will often indulge in this, even until great injury, followed by much pain, is inflicted on the delicate tissues of the skin, as is especially seen in infants with eczema. But this alleviation is generally only temporary, while the real trouble may be greatly aggravated by the scratching. Fortunately, however, science can come to the aid of the sufferer, and by discovering and removing the cause of the sensory disturbance more permanent relief can usually be effected. I will endeavor to mention briefly and to analyze the causes of pruritus, or itching, which may be

connected with and dependent on many disordered and diseased states of the skin and general system, and will also consider some of the measures best suited to reach the different conditions.

Itching, or pruritus, varies greatly in different individuals, partly according to the cause and partly also in proportion to their varying nervous sensibility. It is variously described, sometimes as a creeping or crawling sensation, as of insects beneath the skin, calling for simply mild touching, pinching or rubbing the surface; or it may amount to a deep stinging, pricking or almost burning feeling, urgently demanding severe scratching or even digging into the tissue to reach the seat of the difficulty. Between the extremes of mild and severe pruritus there may be every possible degree of nervous excitation, and the agony occasioned by violent paroxysms of itching, both in infants and adults, is sometimes distressing to witness. In some instances, however, as in mild scabies, the sensation of itching and its relief by slight scratching is said to be rather agreeable; but in the main pruritus is always a disagreeable symptom, and is a clinical sign of something wrong, either in the skin itself or elsewhere in the system; for the healthy subject should be as unconscious of the skin as of the stomach, heart or other organ.

The external signs of itching, largely the result of scratching or rubbing, also vary greatly in different patients, partly according to the nature of the trouble and cause of the pruritus and partly according to the individual affected. Thus the long scratch marks often seen across the backs of those suffering from pediculosis are entirely different from the isolated, scratched lesions seen in another parasitic disease, scabies, and are sometimes almost pathognomonic. In mild, chronic, more or less generalized eczema, there are often long lines left by the finger nails, which are quite different from the separate, torn papules generally seen in urticaria, made by the same means.

But it is often remarkable how few external signs may be presented, even when the patient complains bitterly of the distress caused by itching; this, however, is commonly due to the self-restraint of the individuals, or to the really mild character of the pruritus, which may seem to them greater than it actually is. In many cases, on the other hand, the results of scratching will seem to be out of all proportion to the severity of the exciting cause.

The locality of the itching will also often be a significant feature and contribute to the correct determination of the nature and cause of the trouble: thus, itching on the extensor surface of the extremities would suggest pruritus hiemalis, while itching across the abdomen and upper thighs often indicates scabies or pediculosis pubis, both of which latter are occasionally met even among those well up in the social scale.

The number and variety of different skin affections which may present itching as a more or less prominent feature are so many and varied that it is, of course, unwise to lay much stress on this symptom for diagnostic purpose, for even syphilitic patients may sometimes complain of pruritus. In this latter case, however, there is commonly some other skin condition which will account for it, although occasionally syphilitic lesions will itch more or less.

This emphasizes the necessity of studying carefully the whole of the surface when itching is complained of; one can not be too careful in making an accurate diagnosis in affections of the skin, for lamentable results are constantly met as a result of an erroneous diagnosis, or often from no definite diagnosis at all.

Coming now to the causes of itching we find that they can conveniently be arranged under three general categories: 1, external; 2, idiopathic, and, 3, constitutional Some of these need to be again divided and subdivided, so that the whole subject may be fairly well presented in the following table:

CAUSES OF ITCHING.

- 1. External
  - Miscellaneous
    - Mechanical.
    - Toxic.
    - Climatic.
  - Parasitic
    - Microbic.
    - Vegetable.
    - Animal.
- 2. Idiopathic
  - Neurotic
    - Reflex.
    - Functional.
  - Senile.
- 3. Constitutional
  - Autotoxic
    - Acute.
    - Chronic.
  - Dermato-pathologic.

Let us examine this table a little and briefly consider the various conditions of the skin manifesting itching as related to it.

I. EXTERNAL CAUSES OF ITCHING.

Here we find two main groups: 1, Miscellaneous local irritation, and, 2 parasitic, each of which have several subdivisions:

1. Under miscellaneous local irritants there appear three groups, representing very different conditions: (a) Mechanical; (b) toxic; (c) climatic.

(a) Caused by mechanical irritants, we find the irritability of the skin often occasioned by harsh underwear; some persons experience much trouble when they first put on woolen undergarments, and some think they can never wear them on account of the itching they excite. Also the itching which most of us have experienced at some time on undressing at night, and the irritation which some will occasionally suffer from after a hot bath or a Turkish or Russian bath.

(b) Under local toxic irritation to the skin we have that occasioned by poison ivy and some other plants, also by poisonous dyes in the underclothing; the itching, often very severe, after the internal use of opium, is really a local toxic irritation, although operating from within.

(c) Climatic effects are seen in pruritus hiemalis, which in some patients will return with each advent of cold weather and continue more or less severely during the same. The effects of heat are frequently seen on the skin in the way of prickly heat, miliaria or lichen tropicus; the itching accompanying this is often very great.

2. Parasitic irritants to the skin may also be divided into three classes: (a) Microbic; (b) vegetable; (c) animal.

(a) Thus far we know relatively little in regard to the effect of microbic elements on the skin, but seborrheic eczema, or dermatitis seborrheica, is commonly recognized as such, and at times may be attended with very considerable itching, and it is more than probable that the ordinary microbes found on every skin may contribute a share of irritation resulting in itching.

(b) Vegetable parasites do not, as a rule, occasion much itching on the skin, but ringworm of the scalp will sometimes itch considerably, while eczema marginatum, which is really a tinea of the crotch and genito-anal region, will generally be attended with an excessive amount of pruritus. And it is very important to recognize the true nature of the disease in this locality, for ordinary antipruritic remedies or those for eczema will be of little avail, while proper parasitic treatment will arrest the itching and remove the trouble promptly.

(c) Animal parasites are well known as exciting agents of irritation of the skin, and first among these to be mentioned is scabies, which is constantly overlooked. Even in the best walks of society one continually finds cases of scabies, which have been long neglected, or treated ineffectually for long periods with internal remedies and mild applications, which are quickly cured by proper local treatment. Pediculosis of the scalp, body and pubis is also occasionally seen in private practice, and often will exist a long time unrecognized, the pruritus persisting until suitable measures are employed. All are familiar with the itching occasioned by the bites

or stings of various insects, and must always be prepared to recognize that even fleas and bedbugs may be a cause of itching in persons in the best circumstances of life.

II. IDIOPATHIC CAUSES OF ITCHING.

This group is also divided into two main classes: 1, Neurotic, and, 2, senile, the first of which is again subdivided.

Itching of the skin which seems to be wholly neurotic occurs as (a) reflex and (b) functional.

(a) Reflex irritation of the skin is seen in the itching of the nose, and also often of the anus, from the presence of intestinal worms.

An interesting point comes up here in regard to reflex itching, which is of importance, as it relates to the production of skin lesions by scratching in many cutaneous disorders, and to which I called attention some years ago.[1] This refers to the reflex excitation of the sensation of pruritus in a distant part by scratching or pinching in another locality, either for the relief of itching or experimentally at a healthy point.

Among a considerable number of observations extending over some years on my own person, I found that, while this result could not always be produced, it was by no means uncommon to have it occur, and that the reflex irritation or itching occurred almost invariably on the same side of the body to which a greater or less amount of cutaneous stimulation was applied. In this way is explained much of the itching in such a disease as scabies, in which the insects may be located in very few points, and yet excite reflex itching elsewhere, and as a result of the scratching a large amount of artificial eruption may be excited, with pus infection; the same is true of eczema, in which isolated patches will give rise to itching elsewhere, and as a result of the scratching fresh patches will develop; and the same pertains to other eruptions.

1. Clinical Notes on Pruritus, Jour. of Cutan. and Ven. Dis., December, 1887.

(b) Functional irritation is manifested by the well-recognized disease, true pruritus, more commonly generalized, occasionally local, and also, as I believe, also by dermatitis herpetiformis. Pruritus as a disease is independent of local skin lesions, except those occasioned by scratching, and should be clearly distinguished both from true prurigo and also from the pruritus or itching which is a symptom of so many skin affections. Undoubtedly true pruritus may possibly come from many causes which we do not now know, but so far as can be observed it seems to arise independently, it being another expression of nerve disorder, akin to idiopathic neuralgia, which latter may also affect the skin as dermatalgia. The neurotic manifestations of dermatitis herpetiformis are so pronounced and often so severe that I believe we will find its true cause in a nerve derangement, either in the spinal cord or conducting nerves; there will often be intense itching when there are very few or no cutaneous lesions. In a recent case in the New York Skin and Cancer Hospital the itching, which had been terrible, entirely ceased, and the eruption, which was profuse and very characteristic, practically disappeared for several days after a spinal injection of cocain, which was given to produce anesthesia for an operation on inguinal hernia.

2. Senile pruritus stands alone, as a condition probably due to alterations in nerve structure in common with other degenerations belonging to old age.

III. CONSTITUTIONAL CAUSES OF ITCHING.

These fall into two groups: 1, Autotoxic and, 2, dermato-pathologic, or those relating to itching caused by or attending the presence of pathologic changes in the skin, mainly of inflammatory nature.

1. The autotoxic causes of itching may be divided into (a) acute and (b) chronic.

(a) Although some of the cutaneous affections to be mentioned under the next heading have undoubtedly

more or less of an autotoxic element, there is one disease, urticaria, which manifests this relation to itching so peculiarly that it is placed especially here. All are familiar with the intense pruritus attending this affection and recognize that, while in many cases it may be impossible to trace its cause to any special article of diet, it is constantly seen in violent form after the ingestion of certain articles of food or drink, and its autotoxic etiology from intestinal indigestion and fermentation is well recognized.

There is also a mild form of occasional itching, occurring irregularly in many regions, which may be observed in those exhibiting an acid or gouty state of the system. These little itchy points or places are very fugitive, and the irritation readily subsides with a slight amount of scratching; but when the acidity of the system is excessive they may prove to be more severe and persistent and prove decidedly unpleasant, requiring treatment.

(b) Chronic autotoxic irritation of the skin is constantly seen in the intense pruritus of chronic urticaria and that which often accompanies jaundice and frequently occurs in connection with glycosuria. In chronic Bright's disease it is not uncommon to have a considerable amount of pruritus, either persistent or at intervals.

2. Itching due to dermato-pathologic causes, or that which is associated with or dependent on active disease of the skin itself, generally of inflammatory nature, stands prominent among the most distressing and often rebellious forms which are met. And yet the number of these eruptions, which are often attended with much itching, is relatively small, only about half a dozen need be mentioned.

Eczema, of course, comes first, and pruritus is one of the prominent symptoms of the eruption; it may almost be said, without itching no eczema. The severity and character of the itching of eczema, as all know, may

vary greatly. At times it amounts to an uneasy tickling, while in some cases with a chronic eruption the intensity of the agony seems sometimes almost beyond endurance. In acute cases the sensations are often spoken of as of a prickling or burning character, as well as itching, and the suffering may be very acute.

Erythema multiforme, during its developing period, is sometimes attended with very severe itching, which becomes more of a burning feeling if bullæ are formed.

Lichen planus is commonly accompanied with considerable itching during its early stages, and chronic patches have also some pruritus, but seldom so severe as in eczema.

Dysidrosis, or pompholyx, causes great discomfort from itching while the lesions are forming deep in the skin, and, indeed, commonly lasts until exit is given to the fluid which presses on the terminal nerves.

Prurigo is always attended with a fierce itching during its entire existence, causing the patient to scratch furiously. But true prurigo is exceedingly uncommon in this country, and need hardly be taken into account; many cases thought to be such prove to be chronic papular urticaria.

The itching attending the healing of ulcerations may properly be placed in this group. The sensation may sometimes be rather severe, and is due to the involvement of terminal nerves in cicatricial tissue before they have become accustomed to their new surroundings.

It will be thus seen that pruritus is associated with very many conditions of the skin of different character, and arises from many different causes. In every instance, however, the real nature of the difficulty is probably the same, namely, an irritation of terminal nerve filaments distributed in the skin. Whether these relate to the finer branches of the nerves or to the tactile corpuscles of Meissner or of Wagner, or the corpuscles of Krause, or Merkel's touch cells, can not yet be determined. It is only known that the skin is most abun-

dantly provided with nerve elements, which when disturbed give their danger signal in the way of itching more commonly than by pain.

An important feature to remember in regard to much of the itching that is complained of is that it is generally spasmodic or paroxysmal in character, and that, in many instances, if self-control is exercised, and if the part is not touched, scratched, rubbed or pinched the unpleasant sensation will cease spontaneously. Hence it is often desirable to inculcate self-restraint, and in the case of infants or some others to employ mechanical restraint, as will be mentioned later; for scratching is known not only to aggravate almost any eruption, but even to be the exciting cause of many of the new lesions, in certain affections of the skin.

But, however much self-control is urged, it is futile to expect that it can be practiced in connection with all diseases of the skin. As patients will tell you, the desire to scratch is at times irresistible, and sensible men and women will say that they would rather die than be prevented from scratching when a very severe paroxysm of itching comes on. The frantic efforts to get relief which are sometimes witnessed would be ludicrous if they were not so pathetic. And I may add also that the frantic efforts of the physician to afford medical relief are also sometimes ludicrous, because they are so pathetically unscientific.

Itching, or pruritus, therefore, should always receive the careful attention of the physician, and every effort should be made to determine the true cause or the nature of the difficulty behind it; for, as already hinted, it is Nature's signal that something is wrong, either with the skin itself or in some portion of the economy. He, therefore, poorly does his duty medically who, when consulted in regard to itching, simply prescribes a lotion, or an ointment, or an advertised remedy, instead of patiently ascertaining by careful examination the true condition of all the skin, and then seeking to determine

and reach and remove the real cause of the trouble. How many cases of scabies are scattered through communities by failure to recognize and check the trouble early?

An interesting consideration in regard to itching relates to the well-known tendency to increased trouble at night. The reason for this appears twofold, relating (1) to the condition of the person and (2) to outside influences.

1. By the close of the day a certain amount of nervous energy (of which we know so little) has been expended, and a consequent exhaustion of nerve fiber and power, which is ordinarily renewed by sleep, "Nature's sweet restorer." It is quite natural, therefore, that at that time the exhausted nerves should give their cry of distress at any violence or injury that is done to them by pathologic alterations of the cutaneous structure to which we give the names of various diseases. The terminal nerves are naturally more readily irritated by the effused products of many skin lesions pressing on them, or even by the bites of insects, as in scabies, etc. In the case of idiopathic pruritus, without apparent alteration in the skin, the itching is, as has been before remarked, simply the cry of distress of the debilitated terminal elements in the skin tissue, as a neuralgia is the nerve cry of larger conducting nerves.

As a result of the day's activity the blood is also more filled with the products of catabolism, which are removed by the emunctories during sleep, and which naturally irritate sensitive nerve fibers; as, when there are gross errors of metabolism the brain cells are irritated, causing dreams, even to nightmare and "night horrors." Bouchard[2] has shown a marked difference between the urine secreted during sleep and that of the waking hours. He states, as a result of his experiments: "What is certain is that during the day the body forms a substance which, when accumulated, would induce sleep,

2. Bouchard: Auto-intoxication in Disease, Philadelphia, 1896, p. 41.

and that during the sleep it elaborates, instead of this narcotic substance, a convulsive substance which, when accumulated, could produce muscular twitchings and induce waking."

Another personal reason for greater suffering from itching at night, as sleep comes on, is found in the "subsidence of the higher cerebral functions," whereby the individual loses control of the active powers of the mind and body allowing physical infirmities to assert themselves. Thus we find rheumatic and neuralgic pains often more severe in the night and itching as well. Moreover, not being occupied with mental or other activity, even the same or a less amount of itching is more noticed and gives greater annoyance by disturbing the equilibrium when one desires to sleep.

2. Outside influences have also something to do with recurrent or increased itching at night. The irritation of the skin caused by undressing and by exposure to the air, which is generally cooler than the surface has been when fully clothed, are efficient causes. Many a patient may be comfortable during the day, but when ready for bed may suffer greatly from itching, which will delay or prevent sleep. These patients will also suffer when warm in bed, partly from a reaction after chilling the surface in undressing, partly from too warm covering and partly from friction incident to moving about. Often patients will get up at night to make fresh applications or dressings, but my constant advice is so to dress and treat the affected parts before retiring that this shall not be necessary; and, if possible, that they shall make any additional applications under the bedclothes so as not to expose the surface again to the chilling effects of the atmosphere.

TREATMENT.

Coming now to the treatment of itching or pruritus, it will be seen that this is a large subject, covering many points, and even reaching far into general medicine.

Naturally it can not be expected that the whole ground will be covered, for that would involve the complete treatment of the many different diseases which have been mentioned. There is only time to classify the subject-matter and to direct attention to the lines along which treatment must be pursued, giving some practical suggestions regarding certain points.

Treatment obviously divides itself into: I, Constitutional and, II, local, under each of which heads there are several points to be considered.

I. Constitutional Treatment.—This includes: 1, Dietary and, 2, medicinal, both of which, of course, relate to only a share of the cases, but which should always be borne in mind.

1. Dietary measures certainly are of importance in the class of autotoxic and nervous cases, and also more or less in those of the last class, in which the itching is due to active skin lesions. This need not detain us, for it is based on principles well known to the profession, and which I have often dwelt on at length.

2. The internal medicinal treatment of itching may be considered under four heads: (a) General; (b) neurotic; (c) analgesic; (d) hypnotic.

(a) General treatment naturally does not relate to instances of itching from purely local causes, although even in some of these cases a thoroughly proper general medical treatment will often render the skin less sensitive to local irritants; for it must be remembered that lowered general and nervous vitality predisposes the skin, as any other organ, to disorder and disease. Many a case of dermatitis seborrheica will manifest itching of the scalp or elsewhere on each occurrence of dyspepsia, and prickly heat occurs only when the patient is in a deranged condition of health.

But in regard to a large number of patients complaining of itching, belonging to the last two groups in the general classification presented, internal general or special medicinal treatment is of advantage in removing

the systemic or organic difficulty causing the unnatural sensations in the skin. This, of course, relates to the proper treatment of the various diseases attended with itching, and can not be entered on here, but it is hardly possible to emphasize this too strongly.

(b) In neurotic patients general treatment is often of the greatest service and absolutely necessary in many cases, for it must be remembered that, as neuralgia is a nerve cry, indicating a lowered vitality in some portion of the nervous system, so itching may often be a signal of diminished nerve resistance to external or other irritants, calling equally loudly for help. In aggravated or prolonged itching, therefore, great attention should always be paid to therapeutic measures which restore the nervous system to a normal state and maintain it so. Arsenic may sometimes be of value in connection with other remedies, but alone it is powerless to allay itching. The various proper nerve tonics, iron, strychnin, quinin, preparations of phosphorus, cod liver oil, etc., may each and all of them alone and combined be needed in many cases to effect the desired result. Electricity in the form of static or galvanic current is also of value when properly utilized, and *x*-rays are sometimes of value in arresting itching.

(c) Analgesic internal medication at times may be of great value in the treatment of itching, but is also very often greatly abused, especially when employed empirically or without the use of proper measures to remove the cause of the pruritus. It is well known that opium and morphin are worse than useless, for while insensibility to the suffering may be produced thereby they really aggravate the cutaneous irritability and in the end do much harm; if sleep is thus induced the patient scratches while asleep, and on awakening experiences even more pruritus.

In very rare cases a whiff of chloroform has been of service in producing insensibility, so that other meas-

ures can act; but in the end, if repeated, this also does harm.

Many of the recent coal-tar and synthetic products have been recommended to give relief from itching, and frequently they will have a more or less beneficial effect; but they must be used with great caution, and frequently the subsequent results are unsatisfactory and even harmful. Many times I have seen cases in which the use of trional had certainly aggravated the real trouble, and I have thought that the same was true after some of the other so-called analgesics which have been used of late years.

Veronal, however, seems to be an exception, and I have used it, often in repeated doses, with good effects, and apparently also without subsequent harm. In a number of cases I have enabled the patient to obtain very satisfactory sleep from repeated doses of phenacetin.

A combination of chloral and bromid of potassium, with a little aconite added, will often act well.

Some years ago I wrote favorably in regard to the use of the tincture of cannabis indica in controlling itching, and if judiciously used it is often of value. I have also advised tincture of gelsemium, repeated every hour or even every half-hour, for three or four doses, and have very frequently seen perfect rest secured by it; I have also given it with other mixtures during the day, with good effect, but once, from an overdose, I had very startling and unpleasant effects, even temporary blindness, produced by it.

II. Local Measures.—The local measures which may be employed with advantage for the relief of itching belong to two classes: 1, Hygienic, and, 2, medicinal.

1. The proper hygienic treatment of a skin affected by itching is very important, and, unless correctly attended to, the condition may not yield even to otherwise good treatment. From long observation I am convinced that many, who have the facilities for it, bathe the skin

far too much and often keep up a pruritic state. The normal, healthy skin should have a certain amount of greasy or oily secretion, and when this is too frequently removed by bathing and free use of soap the surface becomes dry and harsh, and its abundant nerves are thereby irritated. Unless caution is given and full directions are insisted on, those in the better classes of society will surely transgress in this particular. Also in drying after bathing, patients will exercise too much friction, and then the overstimulated and excited skin will give occasion for more or less scratching, and the trouble is prolonged in spite of the best treatment. I frequently direct that the skin be dried, whenever a bath is allowed, by soft old hand towels, not ordinary bath towels, a number of them being used, which have been thoroughly heated.

The kind of underclothing is also sometimes of consequence, although I think that its importance is frequently overestimated. I believe that most skins are better with pure woolen garments next to them if the texture is fine and unirritating, although I find that a number do well with the linen mesh undergarments. Cotton is undesirable, and I do not ordinarily favor silk. But I constantly find that if all other treatment is correct, and the skin properly cared for, many persons can wear woolen underclothing who previously thought it impossible.

Restraint from scratching comes properly under this head and is, of course, particularly desirable in the case of infants with eczema. For this purpose I have for many years employed the very simple device of putting the child inside a small pillow case, the head protruding through a hole made in the closed end. This is pulled down to the shoulders, and the arms are secured at the sides by means of several strong safety pins, and one pin is also fastened between the legs, so that the whole wrapping can not be raised. Time and again mothers have expressed the warmest appreciation of this de-

vice, which has completely controlled the child, and allowed proper applications to cure the eruption. It is well to remember here, what was previously said in regard to the spasmodic character of itching, that it often ceases if the part is not touched or scratched. A good apparatus has also been put on the market under the name, I think, of "Scratch not;" this consists of celluloid sleeves, to be fastened at the shoulders, which prevent the child from bending the arm and reaching the face. Another patented affair is sold under the name, I think, of "Hold hand," which consists of perforated aluminum balls, into which each hand is placed, with a sleeve attached, which latter is pinned to the clothing. This is also valuable to prevent thumb sucking.

Even in adults it is sometimes necessary to devise means to prevent scratching, such as gloves, etc. I have sometimes tied tape to the wrists and had it passed beneath the back, so that the effort to reach the face, or the other part affected, will waken the patient.

2. The medicinal means which have been recommended at one time and another and used locally for the relief of itching are so numerous and varied that any attempt to classify or even to mention them seems almost hopeless. From the multiplicity and variety of remedies proposed it is readily understood that there is no one single efficient means at our command to stop itching. This, of course, follows from what has been said in regard to the different causes which may produce pruritus. Each case has to be studied by itself and suitable measures employed to combat the real disease present. Carbolic acid alone stands pre-eminent, and when rightly employed is certainly a valuable remedy and is a constant addition to many applications for the relief of pruritus.

The external applications which more or less control pruritus as a symptom may be divided into those which

are: 1, Soothing and, 2, analgesic; both of these are used in the form of lotions and of ointments.

The calamin and zinc lotion, so widely known, is one of the best, mild, soothing applications in many pruritic conditions. The formula which I employ is composed about as follows:

℞.	Phenol (acidi carbolici)	3ss-3i	2-4
	Pulv. calamin. prep.	3i	4
	Zinci oxidi	3ii	8
	Glycerini	3iii	12
	Aquæ calcis	℥i	30
	Aquæ rosæ q. s. ad	℥iv	120

M. Sig.: To be sopped repeatedly over the surface.

Ichthyol is a very valuable remedy, and in from 10 to 25 per cent. solution, in water or oil, will often act very efficiently; it is also very valuable in ointments.

The liquor picis alkalinus, which I introduced some years ago, is also serviceable. It is made as follows:

℞.	Picis liquidæ	3iv	15
	Potassii causticæ	3ii	8
	Aquæ	3x	40

M.

The potash is dissolved in the water and rubbed up with the tar in a mortar until perfect solution is effected. This is to be diluted in varying strength, one part to ten or to twenty of water, and bathed over the surface, a suitable ointment being applied afterward.

Lead and opium wash is often employed and occasionally will be found effective, but, as a rule, it does not answer so well as other remedies.

Ointments are constantly employed to relieve itching, and if properly constructed and efficiently applied answer well, although often annoying to the patient. For rather mild general itching a carbolized compound lanolin ointment, such as I have often designated "skin food," is valuable, made as follows:

℞.	Phenol (acidi carbolici)	gr. xx-xl	1	30-2.60
	Lanolin	℥i	30	
	Boro-glycerin	3iv	15	
	Unguenti aquæ rosæ	℥iii	90	

M.

This is applied with the palms of the hands and gently rubbed in until about all is absorbed.

A mixture of camphor and chloral is a very efficient antipruritic, made thus:

℞.	**Chloral hydrate**		
	Camphor gum, of each.....3ss-3i	**2-4**	
	Rub together until liquid and add:		
	Compound lanolin ointment (as above)..℥i	**30**	
M.	**Sig.: To be gently rubbed in.**		

If there are any raw surfaces this will sting considerably, but on the unbroken skin it is very comfortable and allays itching greatly.

Many skins do better without any greasy application, and the glycerite of starch can be substituted in the above ointments for the fatty base.

Tar and tarry preparations, oil of cade and oleum rusci, are also valuable antipruritic remedies, and may be freely used without danger of absorption.

Much more could be given in this same line of local therapeusis, but the object of this paper is not to detail the method of treating itching; it is rather to direct serious attention to the many causes of itching and to the necessity of studying all cases very carefully, and by accurately determining and reaching the cause to give relief to the symptom, itching.

DISCUSSION.

Dr. W. T. Corlett, Cleveland, O., said that he understood Dr. Bulkley to say that true prurigo is a very rare affection in this country. Dr. Corlett said that he has seen several typical cases of prurigo, as described by Hebra, and, so far as he has been able to observe them in Cleveland and elsewhere, he believes that, if less common, they are quite as typical here as in Vienna. Dr. Zeisler, some years ago, called attention to cases of prurigo seen in Chicago, which, Dr. Corlett thought, were said to be like those observed abroad.

Dr. George T. Jackson, New York City, remarked that a very severe type of itching is not infrequent at the menopause. Senile pruritus is due not only to changes in the nerves of the skin, but to changes in the skin itself. It becomes thin and dry, and there is an absence of the natural oil, probably due to changes in the sweat glands. These patients sometimes find great relief in simply oiling the skin with cocoa butter.

DR. L. DUNCAN BULKLEY, New York City, said that, in his experience, prurigo differs in different parts of the country. Many cases of supposed prurigo in the Skin and Cancer Hospital eventually prove to be urticaria. Dr. Bulkley said that he has used aspirin, which is supposed to be an anti-icid, and that he agrees in regard to the value of oily applications in certain forms of pruritus. Some of these people bathe too frequently and thus remove the natural oil of the skin; some patients say that their itching is much less troublesome while they are traveling and deprived of their usual baths.

CUTANEOUS TUBERCULOSIS.

REPORT OF A SERIES OF CASES OF SMALL PUSTULAR SCROFULIDE (DUHRING).

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The rapid advance in the study of tuberculosis of the skin during the past twenty-five years has stimulated students of dermatology to greater vigilance in the observation of cases in general, with the result that we have an increased classification, which is at times difficult to comprehend. The necessity of grouping cutaneous diseases under more general headings is obvious for convenience in study. But to do this, and at the same time convey an intelligent idea of the individual diseases, it is necessary to analyze and digest the various synonymous terms and include them in their appropriate situations. It will be my aim in this paper to report a series of cases of small pustular scrofulide, ignoring to a large extent the synonymous terms and showing the relation of this affection to the great class of tuberculides.

The classification of these affections as made by Crocker includes them under two great headings—those directly due to the presence of tubercle bacillus, and those indirectly due to the tubercle bacillus or its toxin. Under the first heading he places lupus vulgaris, lupus verrucosus, scrofuloderma, miliary tuberculosis cutis and erythema induratum.

Under the second heading he includes those affections which have been termed "tuberculides" by Darier and

designated "paratuberculoses" by Johnston. These embrace lichen scrofulosorum, acne scrofulosorum, acne agminata, morbilliform and scarlatiniform erythema, eczema scrofulosorum, pityriasis of Hebra, dyschromia, and lupus erythematosus. It may readily be seen that it would be difficult to find a place here for our cases.

In the study of cutaneous tuberculosis each observer has seemed to feel it incumbent on him to add one or more names to the already copious nomenclature and thereby increase the existing confusion. This condition of affairs is by no means new. Willin and Bateman designated the condition, "lupus," as such on account of its fancied resemblance to the attack of a wolf. Hippocrates mentions the same affections as eating or gnawing herpes, and Celsus describes it under the term of "therioma." Other terms, such as herpes exedens, herpes ulcerosus, dartre rongeante (Alibert) and eating tetter, were also employed by early medical authorities. The translations of the early Arabian writers introduced the titles formica corrosiva and formica ambulativa, thus rendering the Arabian word that corresponds to the eating herpes of the Greeks.

Mention is made of this variation in nomenclature, both ancient and modern, to illustrate the difficulties encountered in reporting cases of unusual interest in properly designating and classifying them. The cases I have the privilege of reporting, for instance, may be described with accuracy under the term "small pustular scrofuloderm," the appellation coined by Duhring. Side by side with this we have a choice of the terms folliclis (Barthelmy), acne necrotica (Boeck), acne varioliformis (Hebra), impetigo rodens (Dewergie), and a host of others. Surely this is confusing, as no two of these terms are accompanied by descriptions sufficiently similar to be fused into one.

The only solution that seems to suggest itself is to reject all except the terms tuberculide or paratuberculide, reserving it for the great aggregations of infec-

tions indirectly due to the tubercle bacillus. Descriptive adjectives could then be supplied to designate the clinical variety; for instance, small pustular tuberculide, small papular tuberculide, ulcerating tuberculide, etc. In cases of the diseases directly due to the tubercle bacillus there seems to be no confusion, and I would not venture to suggest any change, but in these allied affections a new departure of some kind is necessary. In the cases of syphilis the nomenclature is almost perfect; no one thinks of giving a special name (others than its descriptive title) to unusual aggregations or appearances of the lesions; they are syphilides, and may be large, small, papular, pustular, ulcerating, etc., but never enter into the entanglements so common to the tuberculides. I classify my cases under the head of tuberculides, since it was observed by one of the original writers (Duhring) that the affection was common in "scrofulous" individuals and those in whom a family history of "scrofula" could be obtained.

CASE 1. *History.*—E. S., female, aged 13, Hebrew, born in Odessa. The father and mother had always enjoyed good health. The father, however, when he arrived at the age of the patient was the subject of a pustular eruption which had lasted for two years. A most careful interrogation failed to bring out any information that would aid in properly designating this eruption. The father died at the age of 60 years, two years previous to the time at which this child presented herself. There was no history of consumption or other common forms of tuberculosis in the family. The patient had four brothers, all of whom were healthy. There was one sister, and she also developed an eruption in early childhood, that underwent involution, leaving behind many scars, but since then she had been entirely free from any eruption.

The first manifestation of the eruption in our patient, according to the statement of the mother, was at the age of 16 months. At the time she came under observation, the face, backs of the hands, wrists, elbows and knees were the sites of a pustular eruption, with lesions in various stages of development. Some were mature pustules; some were crowned with ebony-like crusts; others were acute. There were many white scars representing the sites of remote lesions.

Small pustular scrofulide.

The more recent were designated by scars of a deeper color; those of about six months brown, those more recent a dark blue. The first visit was in March, 1900, at which time tonic treatment was instituted and then continued for one year with most excellent results. The lesions had undergone partial involution. Three years later she was again seen with a slight eruption on the hands and arms, and one pustule on the forehead, which latter lesion was said to have occurred on the site of a mosquito bite. The case then passed into other hands. She was exhibited at a meeting of the Philadelphia Dermatological Society, in 1904, by Dr. Henry W. Stelwagon, at which time she had but a few lesions on the hands.

CASE 2. *History.*—M. S., female, aged 19, Hebrew, born in Russia, sister of the patient in Case 1. This patient gave the history of an eruption similar to that of her sister, and on careful examination exhibited scarring not unlike that of variola, confined to the face, arms, hands and knees.

CASE 3. *History.*—R. C., female, aged 14 years, Hebrew, born in Russia. The father and mother were healthy. The father, in childhood, had had an eruption similar to that of which the patient complained. The patient had three sisters and three brothers. One of the sisters and two of the brothers were affected with the same condition. Otherwise the family history was of no importance. When the patient was one year old the eruption appeared, and has continued almost uninterruptedly ever since. It consisted essentially of small pustules, most of which followed some trivial injury, such as a scratch. These pustules passed through various stages of development and disintegration. The most prominent stage was that in which a brownish or blackish crust was formed, which when cast off revealed a pitted scar resembling variola. The eruption in its entirety, when observed on several occasions, consisted of slight scratch marks, pustules, crusts and varioliform scars, distributed over the face, hands, wrists, elbows and knees. As in the preceding case, tonic medication was employed with comparatively good results.

CASE 4. *History.*—F. G., female, aged 8, sister of the patient in Case 3. The eruption appeared when the child was six months old. The case came under observation at the same time as the preceding and was identical in every respect.

CASE 5. *History.*—A. G., aged 6, brother of the patients in Cases 3 and 4. This case differed in no respect from the two preceding, having all the characteristic lesions induced in the same manner.

CASE 6. *History.*—J. G., male, aged 5, brother of the patients in Cases 3, 4 and 5. This case requires no special description, as the condition was exactly the same as the foregoing. These members of this family were exhibited individually and collectively before the Philadelphia Dermatological Society on more than one occasion, and the diagnosis confirmed by its various members.

CASE 7. *History.*—R. G., female, aged 8, Hebrew, born in Russia. The family history was entirely negative, there being no trace of tuberculosis or any cutaneous eruption. The manifestations occurred after some slight traumatism, and consisted of pustules, crusts and pinhead to pea-sized pitted cicatrices. The lesions occurred on the face, hands, elbows and knees.

CASE 8. *History.*—E. F., aged 7, Hebrew, born in Russia. The family history showed no affections that could in any way be connected with the eruption which began early in the life of the patient and possessed all the characteristic features common to the other cases.

CASE 9. *History.*—H. M., female, aged 5, Christian, born in America. The father was born in Austria and the mother in America; both were in the best of health. One brother of the mother had been the subject of Pott's disease and another had died of "consumption." The patient had two sisters and three brothers, all of whom were healthy.

Before attempting an analysis of these cases we beg leave to quote from Stelwagon the following slightly paraphrased quotation from Duhring's original description:

The face and upper extremities are its usual sites. The lesions are disseminated and as a rule not abundant. They begin as pinhead to pea-sized papulopustules, resembling somewhat closely the small papulopustular syphiloderm. The pustular character is often slight and occupies the central part of the summit, the outer portion of the lesion being slightly hard and in the beginning with an insignificant areola. The formation is superficial, not extending deeply into the derma. They crust over gradually in the course of from one to several weeks, with depressed, shrunken, hard or horny, yellowish or grayish adherent crusts, which in time drop off, leaving marked, punched-out-looking, indelible scars, resembling those of variola. The lesions are further characterized by a sluggish, chronic course, and may last weeks or months. They appear at irregular periods, new ones coming out as older ones dis-

appear, so that the patient is rarely free from them. The disease may continue for years.

It is only fair to state that many of the more recent writers have described this condition under the term "acne varioliformis," but I am inclined to favor the older classification, although I can not but defend the argument that it should be entitled "small pustular tuberculide."

A careful digest of the scant histories we have given will show several interesting features. The first prominent particular is the fact that the patients were all children and, with one exception, Hebrews and of foreign-born parents. This indirectly would serve to advance the theory that it was a disease peculiar to the cities, since immigrants of this class tend to congregate in the pauper settlements of the cities.

A second prominent point in the series of the cases is the tendency to occur in families. Cases 1 and 2 occurred in the same family, and while the patient's history in Case 2 is not sufficiently detailed for scientific purposes, it is convincing from a clinical standpoint. Cases 3, 4, 5 and 6 occurred in the same family. These were observed collectively by several competent authorities, and at one time by Dr. Duhring, thus completely effacing any doubt as to their similarity.

A third feature worthy of remark was the appearance of the lesions on the sites of trivial injuries such as scratches. In children of the slums itching is common by reason of the absence of everything that approaches hygiene. Sometimes it is due to the parasitic diseases and at others times not. In these cases the parasitic diseases were readily excluded. But it would not have been difficult for the novice to have associated these pustules, papules and crusts with scabies, for instance. The situation of the lesions on the face should remove such confusion.

A fourth interesting event was the improvement under ordinary tonic treatment. Unfortunately the pa-

tients were of a class that is unable to give continued attention to any form of medical treatment, so that cure even with the best of remedial measures is always a most remote possibility.

In conclusion I can only briefly refer to the circumstances that in only one instance was it possible to elicit any family history of tuberculosis, and that was in the case (Case 9) of the child born in America, whose mother also was American born. It is sincerely hoped that the contribution of this small group of cases may add somewhat to the knowledge of cutaneous tuberculosis.

LICHEN SCROFULOSORUM.

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My clinical experience is not in accord with the general opinion of dermatologists regarding the frequency of lichen scrofulosorum in America. It is generally believed that the disorder is almost unknown in our country. Bronson, Shepard, Gottheil, Hyde and Gilchrist have each reported a case, making a total of five cases reported in thirty years. Stelwagon states that, although he has very many children under his observation, he has never seen a case.

I believe that the disease is much more common than is usually supposed; it is not observed because it does not occur in dermatologic material, and hence it is not seen by dermatologists, and physicians in other departments of medicine do not recognize the disease when it passes under their observation. The eruption is of an insignificant character, and hence it is apt to be overlooked even by those who are competent to recognize it.

The disease is always associated with some distant focus of tuberculosis. It is not often seen in association with pulmonary tuberculosis, but rather in cases of surgical tuberculosis, such as bone, joint and glandular tuberculosis, and as these conditions require careful treatment a few indistinct papules on the abdomen are apt to pass unobserved.

The eruption is, at best, of minor importance, as it requires no treatment. To the dermatologist a study of the cases is of importance because of their general

relation to the pathology of cutaneous tuberculosis. To the general practitioner this eruption would be of the utmost value in detecting hidden tuberculous deposits if it were uniformly present in association with deposits which can not be discovered clinically, but inasmuch as it is usually associated with some well-defined tuberculous lesion it is only in those few cases in which a tuberculous affection can not be easily detected that it is a diagnostic point of value.

My attention was attracted to lichen scrofulosorum a few years ago when, on entering the examining room of a hospital, I found a surgeon examining a little girl. On seeing me he remarked that he suspected that the child had Pott's disease and he was endeavoring by examination to detect a possible psoas abscess. Pointing to several clusters of papules on the abdomen of the little patient, I asked my colleague what he thought was the nature of the eruption present. He said that he did not know what the eruption was, but he had seen it a few times previously. It was a typical case of lichen scrofulosorum in association with a concealed deposit of tuberculosis of the spinal column.

This experience caused me to search constantly for this form of eruption in all cases of surgical tuberculosis which have passed under my osbervation, and, although the cases of joint, bone and glandular tuberculosis of childhood I have been able to examine have not been numerous, I have discovered four cases. It is impossible to determine the exact per cent. of cases of surgical tuberculosis of childhood which present lichen scrofulosorum without repeated examinations of very many children.

It is not uncommon to have surgical tuberculosis present for months before the eruption appears. It is especially apt to make its appearance whenever tuberculosis causes fever in a child. Where Koch's lymph is injected and causes fever, lichen scrofulosorum sometimes appears at the point of injection.

The number of cases which are detected accidentally without the physician being constantly on the watch for the disease are few in number.

The following is a brief résumé of my cases:

CASE 1.—Girl, aged 4, born in America of Italian parentage. Family and personal history not obtainable. She had chronic pyogenic nasal infection, scrofulous keratitis, excoriated upper lip. The cervical glands on the left side were enlarged and suppurating; they had been incised and caseous material could easily be expressed from the opening. The temperature was 102 F. Scattered over the abdomen were six or eight dollar-sized clusters of lichen scrofulosorum, consisting of infiltrations the size of a head of a pin, each about a pilosebaceous opening; these infiltrations were not elevated. They were of a slightly reddish color in some clusters, and in others the papules were the color of the healthy skin. Tissue was obtained from this case for microscopic examination.

CASE 2.—Boy, aged 8 years. In the surgical department of the hospital because of Pott's disease. Father died of tuberculosis; mother is living and healthy. His disease began when he was four years old. He was shown to me by the interne as a remarkable case of keratosis pilaris. On stripping him I found well-marked keratosis pilaris limited to the extensor surfaces of the arms. The eruption on the abdomen was entirely different; it was arranged in coin-sized groups, did not consist of keratotic plugs which could easily be picked out of the follicular openings like those on the extensor surfaces of the arms, but rather of indistinct infiltrations around the pilosebaceous openings, some of which were slightly elevated, and others somewhat scaly.

CASE 3.—Girl, aged 7 years. Her father died of tuberculosis and a sister has the disease at the present time. The patient has been ill with tuberculosis of the shoulder joint for more than a year. The joint was operated about two months before the eruption appeared. In addition to the joint affection, the child had pale lips and conjunctiva and abdominal ascites, probably amyloid degeneration of the abdominal organs. The eruption was discovered by the nurse while bathing the child. Its location was unusual; the abdomen was free from lesions, the eruption was limited to the back over the sacral region, and later it appeared on each leg near the ankle.

CASE 4.—Girl, aged 2 years. Both parents died of tuberculosis before the child was a year old. Six months ago a swelling of the right ankle developed, an abscess formed in the sub-

cutaneous tissue about the joint; it was incised and found to be tuberculous; the joint was not affected. The eruption, lichen scrofulosorum, appeared about four months after the tuberculous abscess was incised; subsequently numerous subcutaneous tuberculous deposits formed in various parts of the body, and when three years old the child died of tubercular meningitis. The eruption was present on the abdomen in the form of coin-sized clusters of pilosebaceous papules, which were in most instances not elevated; in a few places they did present some elevation, and a few exhibited central depression. They were of a reddish color.

DIAGNOSIS.

The eruption is almost invariably observed in children affected with tuberculosis. It is located on the abdomen, rarely on the back, and when it affects the extremities it does so by the appearance of a second crop of papules. The individual papule is the size of the head of a pin, rarely larger, often the color of the normal skin and usually not elevated. It can best be seen by stretching the skin between the finger and thumb. After remaining unchanged for several weeks, the papules disappear by becoming scaly; the scale covering each papule is the size of the head of a pin and somewhat large; it is loosened on the border and attached in the center.

HISTORY.

At the International Dermatological Congress of 1889 the Germans contended that lichen scrofulosorum was a form of lichen, while the French maintained that it was a form of eczema.

The following year Schweninger and Busse called attention to the frequency with which the eruption appeared after injection with Koch's lymph. It was this observation, the correctness of which was quickly confirmed, that gave an impetus to the study of the disorder and led to the opinion, which is now generally accepted as correct, that lichen scrofulosorum is a manifestation of tuberculosis.

THE TUBERCULIDES.

We have in dermatology a certain number of eruptions of the skin which are atypical forms of tuberculosis. Some believe that they are due to toxins derived from distant foci of tuberculosis, others that they are caused by bacilli which have undergone some bio-chemical change, and still others that they are forms of tuberculosis in which the characteristics of the tubercle are less easily demonstrated than ordinarily. This latter theory is the opinion which is steadily growing. None of the tuberculides present the clinical history of tuberculosis.

HISTOPATHOLOGY.

The most important microscopic finding in lichen scrofulosorum is a cellular hyperplasia about the pilosebaceous follicle. In most cases studied in recent times with the employment of modern methods of technic, and also in the light of our present knowledge of atypical tuberculosis of the skin, it has been found that sufficient of the necessary architecture of the tubercle was present to warrant classifying this disorder as a form of miliary tuberculosis, although bacilli, giant cells, and even epithelioid cells, may not be found in a given case.

Lesseliers examined seventeen cases, finding the structure of the tubercle present in fourteen cases. I was able to obtain tissue from only one of the cases which I observed, the histo-pathology of which corresponded fully with that of atypical tuberculosis.

THE VESSEL CHANGES AND OTHER HISTOLOGIC FEATURES OF CUTANEOUS SYPHILIS.

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While the literature covering the pathologic anatomy of syphilitic lesions is very extensive, it contains little which tends to elucidate the manner in which the process develops and spreads, many of the descriptions applying equally well to the other infectious granulomata. In order to arrive at any satisfactory conclusion or obtain a proper conception of the reaction the syphilitic organism produces it is necessary to examine an enormous amount of material, not only in different stages of evolution of a given lesion, but also in series. The present article is an endeavor, not by any means to cover the entire histopathology of cutaneous syphilis, but rather to point out some features in the histologic picture of the early and late lesions which are more or less pathognomonic and which perhaps offer some data on which to base a microscopic diagnosis.

Aside from the presence of the spirochætæ in the tissues, the reaction which they excite is more or less peculiar to this condition and should enable one to make a diagnosis in the majority of instances. It is a not infrequent experience of dermatologists to meet with cases where surgeons have excised initial lesions on extragenital parts under the mistaken diagnosis of malignant growths. To the expert the clinical features of

such lesions should be sufficiently distinctive to exclude the latter, and where there is a doubt it is often a simple matter to examine histologically and differentiate the growth from carcinoma, which is about the most common condition which comes into question.

Hoffmann[1] believes the spirochætæ enter the lymph spaces of the rete where they are protected against phagocytosis or immediately make their way into the lymph vessels of the papillæ. Only after about three weeks, when multiplication has taken place, does a reaction appear. The first changes then would be an endo- and perilymphangitis, followed by budding of capillaries, infiltration and connective tissue hyperplasia. According to the findings of Ehrmann[2] the lymph vessels are involved secondarily, the earliest change taking place in the connective tissue interstices, followed by new capillary formation and perivascular infiltration. He based his deductions on gelatin injection experiments with initial lesions immediately after their excision. Unless special technic is observed the vessels can not readily be differentiated. In a general way, however, the arteries are distinguished from the accompanying veins and lymphatics by their thicker coats and greater abundance of elastic fibers. In an infiltration the media is relatively free and appears as a band separating the intima from the exudate. The walls of the lymphatics are thinner than those of the veins. The lymphatic capillaries are apt to have a more irregular lumen than the blood capillaries and a less complete lining. Their lumina often contain infarctions of a homogenous substance and sometimes a few lymphocytes.

In practice, as a rule, patients do not present themselves until some days after the appearance of the primary sore, when it has already progressed beyond the classical coat-sleeve infiltration and both blood and lymph vessels are involved. The following are brief de-

1. Die Ætiologie der Syphilis: monograph, 1906.
2. Archiv. f. Derm. u. Syph., 1904, lxviii, 1.

scriptions of several chancres, all with the same characteristic changes but in different stages of development:

In one, less than a week old, the epidermis was eroded over a portion of its extent and compressed into a narrow band with obliteration of the pegs. Beyond the erosion acanthosis and emigration of leucocytes were the chief changes. In the corium the infiltration was quite diffuse superficially, encroaching upon the epidermis, but below it was distinctly "coat-sleeve" (Fig. 1), and consisted of small lymphocytes, plasma cells, mast cells and proliferated fibroblasts, many of the latter being uncommonly long, either spindle-shaped or stellate with fine processes. Large cells also appeared with irregular bodies, granular protoplasm and hyperchromatic nuclei, some eccentric and others central; they were probably cross sections of swollen fibroblasts. Where the cells were confined to the vessels they were several layers deep and consisted of the round and plasma variety. The capillaries were increased in number and, with the exception of a few in the upper cutis which were dilated, the majority had either swollen or proliferated endothelium. The walls of the larger vessels were thicker than normal and their lumina somewhat narrowed. A number of the lymph spaces were simply dilated, others showed proliferated endothelium. There was no apparent collagenous hypertrophy or edema.

In a specimen six days old the epidermis over the most active part of the lesion was converted into a flattened amorphous layer containing many round and polynuclear cells and, superficially, blood pigment. The ridge system was replaced by a dense zone of cells, lymphocytes predominating. On either side the contiguous epidermis showed acanthosis and emigrated leucocytes. In the cutis the area of greatest intensity was made up of many new-formed capillaries and an infiltration of lymphocytes, plasma cells, mast cells and fibroblasts. A number of occluded blood and lymph capillaries were scarcely recognizable in the dense exudate;

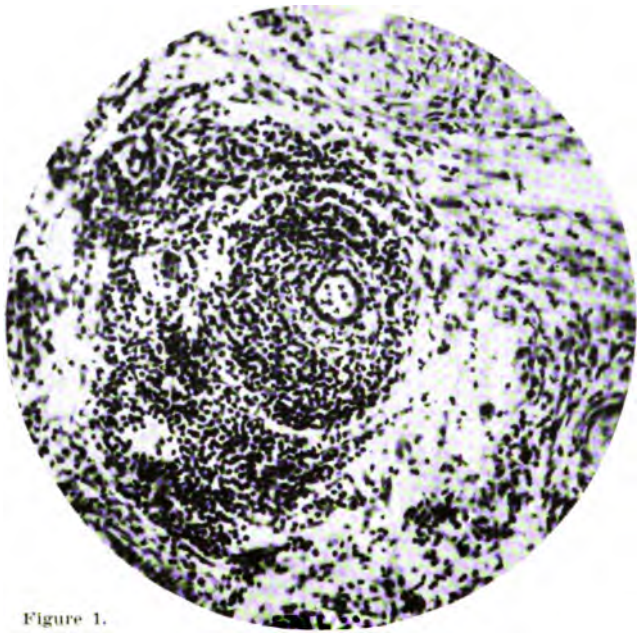

Figure 1.

Figure 2.

Fig. 1.—Chancre of the penis. (Zeiss 8 mm., comp. oc. 4.) An early lesion with mantle of round and plasma cells about vessels. The latter are increased in number and show an endothelial proliferation. The intervening connective tissue contains hyperplastic fibroblasts and a few plasma cells and lymphocytes.

Fig. 2.—Chancre of the penis. (Zeiss 8 mm., comp. oc. 4.) An older lesion still showing the ensheathing of the capillaries with lymphocytes and plasma cells, but with the infiltration more diffusely distributed through the remaining tissue. All the vessels have a proliferated lining. In the center is seen a longitudinal section of a capillary.

others had swollen or proliferated endothelium and had their lumina distended with blood or narrowed as the result of proliferation and compression. The larger vessels showed a decided thickening and infiltration of the adventitia, with or without a corresponding change in the intima. The connective tissue of the cutis was the seat here and there of a slight fibrosis.

In an ulcerated chancre there was a great increase in capillaries in the upper layers of the corium, some of which were filled with blood; others were empty. The infiltration, of the same type as in the preceding cases, was so dense that the cells had the appearance almost of a mosaic. Longitudinal, oblique and transverse sections of the capillaries showed proliferation of their lining and narrowing or obliteration of their lumina (Fig. 2). The larger vessels in addition were the seat of a periarteritis and infiltration. In the inferior portion of the cutis were present several large vessels containing organized thrombi, their walls presenting the characteristic changes of a panarteritis. There was no appreciable hypertrophy or edema of the collagenous tissue.

In a chancre at the height of its development there was an acanthosis of the epidermis, with clubbed and knobby rete pegs, some edema and parakeratosis. The cutis was very cellular, only a few strands of connective tissue being visible here and there. A narrow band in the inferior portion of the cutis had the appearance of condensation. A number of blood and lymph capillaries in the papillary layer were dilated and empty, with no apparent change in their endothelium. In those situated more deeply, however, an endarteritis obliterans was present and only solid cords remained to indicate their previous position. Many of the vessels contained thrombi of a homogeneous material which partially or completely filled their cavities. Evidences of fatty degeneration and retrograde metamorphosis were present in patches of cloudiness and vacuolization.

In sections from the edge of a fully-developed chancre, including healthy tissue, were seen some acanthosis of the epidermis, the pegs being more widened than lengthened, and an invasion of leucocytes. In the papillary and upper reticular layers of the corium through the edge of the chancre the infiltration was diffuse and the blood and lymph capillaries were markedly dilated and increased in number, some containing thrombi. Endothelial proliferation was slight, the cells being more closely packed but not encroaching on the lumen. Passing through the reticular layer of the hypoderm the infiltrate was very dense and many of the cells so distorted from pressure that it was difficult to say to which type they belonged. In this area no lumina were visible, only the thickened occluded vessels. In the adjoining tissue an endo- and periarteritis were present and the perivascular exudate was composed largely of plasma cells. Bands of hypertrophied connective tissue surrounded some of the vessels and part of the active infiltration.

Summing up, then, the main features of the primary lesion we have: 1, An increase in blood vessels and consecutive changes in their walls; 2, cellular infiltration; 3, involvement of the connective tissue; 4, secondary epidermic changes.

Many causes have been assigned to the hardness of the sclerosis, as capillary lymphangitis with suffusion of the neighboring connective tissue;[3] infiltration cells, thickening of the vessel walls, new growth of connective tissue and dryness and rigidity of the cutis; hypertrophy of the collagenous tissue;[4] swelling of the collagenous tissue, distension of lymph spaces with lymphocytes and an edema.[1]

Of those that have come under my observation only a few showed fibrosis and, with the exception of two, in so slight an amount that it does not seem sufficient of

3. Ricord, quoted by I. Neumann: Syphilis, 1906, p. 74.
4. Unna: Histopathology of the Diseases of the Skin, p. 529.

Figure 3.

Figure 4.

Fig. 3.—Small papular syphilide, *Lichen Syphiliticus*. (Spencer 1 in., comp. oc. 4.) Illustrating the follicular nature of the lesion. The process extends along the hair follicle into the cutis below the hair papilla and consists of a reticular structure with round, plasma and connective tissue cells in its meshes. Inside the area many of the vessels are completely obliterated; others are thrombosed and simulate giant cells. At the periphery of the infiltration a few engorged vessels are present. Away from the perifollicular part the vessels are thickened and sheathed by a few round and plasma cells. The coil glands are surrounded by the same cellular elements and are the seat of a marked fatty degeneration. Two outgrowths from the affected hair follicle penetrate the active process. The epidermis presents no noteworthy changes.

Fig. 4.—Papular syphilide. (Spencer ½ in., Zeiss comp. oc. 4.) A lenticular papule removed in the early stage of the disease, showing acanthosis of the epidermis, with dense infiltration of leucocytes and necrosis of the upper layers. In the papillary bodies there is slight sheathing of the vessels with round and plasma cells. The lesion is produced chiefly by epidermic hyperplasia.

itself to produce the degree of hardness clinically appreciable. The two referred to are the last one above described and a flat chancre in which hyperplasia was a noteworthy feature. In another lesion of the chin, which was very hard clinically, the sections were almost entirely cellular, with numerous vessels and but little connective tissue, so that the collagenous tissue hypertrophy as the factor which has been evoked by Unna and others does not seem to explain the condition. The closely aggregated sclerosed vessels probably play a greater rôle than has been given them.

The erosion is analogous to the central involution of the later lesions and is due to necrosis of the infiltration and the overlying epidermis. In phagedenic chancres one or several elements are to be considered; either secondary infection, lack of resisting power on the part of the affected individual, vessel changes and possible toxins capable of producing local necrosis.

The involution of a chancre is brought about by fatty degeneration, the compression and narrowing of the vessels leading to disturbances in nutrition and retrograde changes. Ehrmann is of the opinion that spontaneous healing takes place by phagocytosis.

When it comes to secondary manifestations of the disease, as a rule, all doubt is removed and a histologic examination as an aid to diagnosis does not come into question, excepting, perhaps, in certain drug eruptions, as bromid and iodid, which may simulate very closely certain ulcerative and fungating syphilitic lesions. A case of this sort recently came under my observation, where fungating lesions were present about the face and genitals of a young woman along with a general rash, which were distinguished with great difficulty from a possible specific infection. Fungating growths of the vulva resembling flat condylomata were examined very carefully for spirochætæ with negative result.

The evolution and histology of the roseola and papule seem to show that these lesions are embolic rather than

toxic. A possible explanation of the development of circinate and gyrate lesions by the involvement of a terminal vascular cone has been suggested.

In the roseola Hoffmann[1] found spirochætæ in the dilated end capillaries of the papillæ, and the long interval which elapses between their entrance in the body and the appearance of the efflorescence suggested that the organisms give off few toxins, which only after a longer period are capable of producing a deleterious effect. Or, according to Thalmann, an endotoxin liberated on destruction of the body may be causative.

Histologically, a macular lesion presents a mild reaction. The epidermis may be unchanged or flattened out with loss of the ridge system. In the upper corium the vessels were moderately dilated, filled with blood and ensheathed by a slight infiltration of round cells. The endothelium was swollen, and round and spindle cells were seen in the adventitia of the larger vessels. The cutaneous appendages were normal and surrounded by a few lymphocytes.

The small miliary papule, lichen syphiliticus (Fig. 3), is a follicular process extending from the epidermis into the cutis below the hair papilla. The infiltrate was located about the hair follicle, which remained intact and sent outgrowths into the surrounding nodule, which nodule was composed of a reticular structure holding new-formed blood vessels, round, plasma and connective tissue cells in its meshes. Most of the vessels inside of the nodular area were obliterated, but at the periphery they were filled with blood. A number of the superficial ones were thrombosed and appeared like giant cells. Away from the perifollicular disposition the vessel walls were thickened somewhat and mantled by round and plasma cells. The coil glands were frequently the seat of a marked fatty degeneration and surrounded by an effusion of round and plasma cells. The erector pili muscles were likewise infiltrated. The epidermis was slightly edematous and thinned. There was

Figure 5.

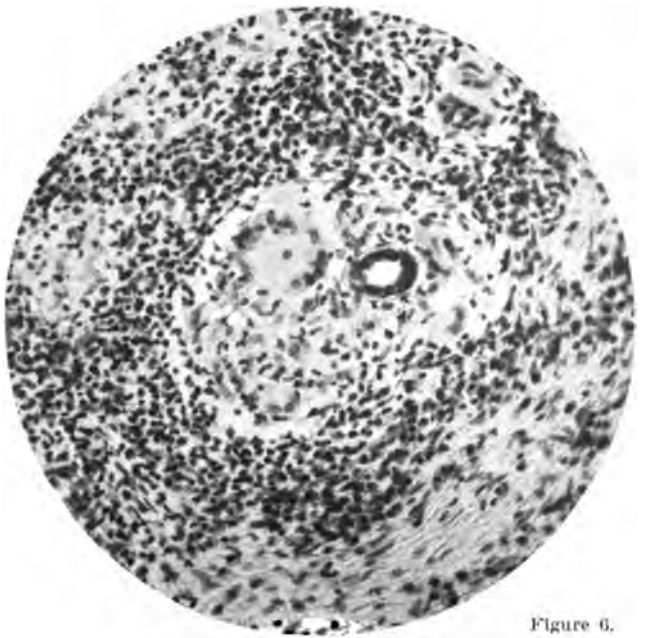

Figure 6.

Fig. 5.—Tubercular syphilide of the face. (Spencer ¼ in., Zeiss comp. oc. 4.) Showing obliteration due to endothelial proliferation and mantling of the transformed vessels by round and plasma cells.

Fig. 6.—Tubercular syphilide. (Zeiss ¼ in., comp. oc. 4.) A section showing obliterated and thrombosed vessels with a perivascular infiltration of round and plasma cells. A number of the vessels show simply an endothelial proliferation. The one in the center is, in addition, thrombosed and simulates a giant cell.

present sometimes a pustule, produced by the instability of the tissue matrix and liquefaction of the syphilitic infiltrate.

In the large papular syphilide there were present in the epidermis parakeratosis, acanthosis and edema, with a marked invasion of polynuclear leucocytes. Epithelial mitoses were rather frequent. The cellular infiltration in the early stages (Fig. 4) of the lesion was limited to the vessels in the upper part of the corium, and the papule was produced chiefly by the epithelial hyperplasia, but later it was more diffuse and surrounded all the vessels of the deep and superficial plexuses. Most of them had thickened walls and consequent diminution of their caliber, but here and there a few remained dilated and showed little if any change. Some were partially thrombosed. Not infrequently immediately about some of the vessels and coil glands there occurred a degeneration of the connective tissue, reducing it to a fibrillary network which took the basic stain faintly and was probably toxic in origin. The cellular exudate was composed of round cells with a few plasma cells scattered between them. There was also hyperplasia of the fibroblasts. The pustulation which occurs in the large papule represents in a major degree the central involution which takes place.

The rupial syphilide showed a very marked parakeratosis with leucocytic infiltration of the entire horny layer and here and there an aggregation of cells, coagulated serum and detritus entering into the crust formation. The overgrowth of the rete was irregular, many of the pegs being narrow and pointed, others widened and bulging into the cutis. It was edematous, in places necrotic, and lymphocytes were so numerous in it that many of the epithelial cells were completely hidden.

The cellular effusion in the corium was quite superficial, being almost limited to the papillary and immediately subjacent layer, except where it followed along the course of a hair follicle or mantled a few of the

deeper vessels and coil glands. In the papillæ blood and lymph capillaries were markedly dilated, some containing a homogeneous substance. Where the inflammatory reaction was most intense the vessels were narrowed, the larger and deeper ones showing more of an adventitial proliferation. The fibroblasts were increased in number; no giant cells were present. A mucinous degeneration appeared about the coil glands and some of the vessels.

In the nodular or tubercular syphilide the entire cutis from the epidermis to the subcutaneous fat tissue was involved, under a low power showing alternating light and dark areas, the former representing the altered blood vessels and the latter a cellular effusion. Under the high power the infiltration was composed of plasma and giant cells, lymphocytes and hyperplastic fibroblasts. The vessels, increased in number, showed the effects of an obliterating endarteritis (Figs. 5 and 6), their former site being marked by solid cords, groups of irregularly-disposed cells with pale staining nuclei and giant cells with peripheral or central nuclei or both. Near the edge of the section were a few vessels with narrowed lumina and a hyperplasia of all their coats. A number of the lymph spaces were thrombosed. The few remaining bundles of connective tissue had here and there a vacuolated appearance, the result probably of a fatty degeneration and beginning regression. The epidermis was flattened out into a very thin band.

The gumma (Fig. 7) compromises the derma throughout its entire extent with marked vascular changes, a diffuse infiltration and necrotic foci. Viewed with the low power, there was apparently a decrease in the number of blood vessels, but on careful examination it was found that many were obliterated or had their caliber reduced and their walls thickened. The infiltration consisted of lymphocytes, plasma cells and a large number of hyperplastic fibroblasts. One or more areas of caseation were observed and about them fragmented

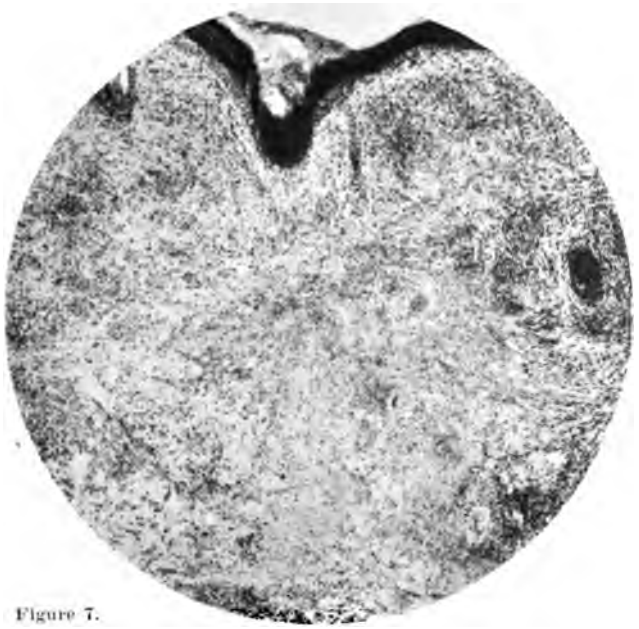

Figure 7.

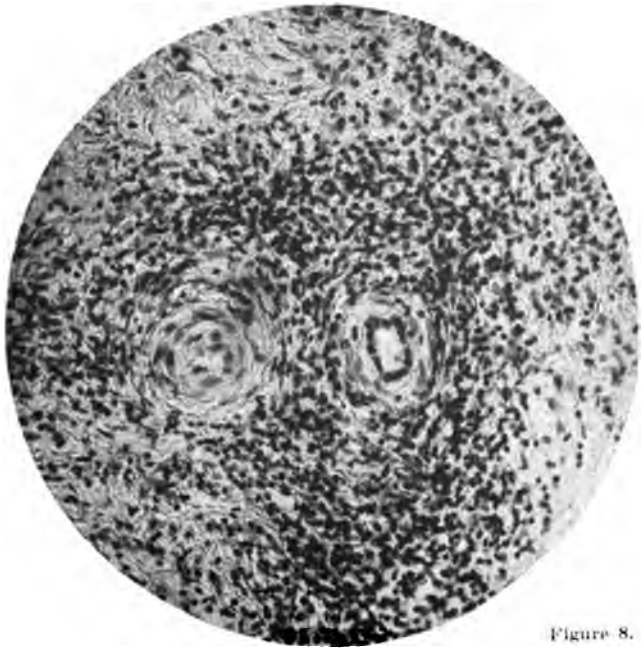

Figure 8.

Fig. 7.—Miliary gumma of the skin. (Spencer 1 in., comp. oc. 4.) The cutis is uniformly infiltrated with round, plasma and proliferated connective tissue cells and here and there shows areas of caseation. One is seen in the illustration in the middle third of the corium just to the right of the median line. The vessels have their caliber reduced in size or are entirely obliterated. The epidermis is thinned and its pegs are flattened out.

Fig. 8.—Symmetrical atrophy of the skin with syphilis. (Spencer ¼ in., Zeiss projection oc. 2.) Cross sections of an artery and a vein. The former shows a proliferation of its intima and adventitia with narrowing of the lumen; the latter is completely occluded by intimal proliferation. Surrounding them is an infiltration of round and plasma cells.

nuclei. When intact the epidermis usually presented no changes beyond a reduction in thickness.

From the foregoing descriptions it will be seen that the differences existing between the various specific lesions are of degree rather than kind. With the exception of the macular syphilide, all consist of a dense infiltration of the same kind of cells, as a rule the lymphocyte being the most common. However, in some specimens lymphocytes in others plasma cells predominate, but not with sufficient constancy to accept their presence, numerically, as of pathognomonic value. The exudate begins in the papillary layer about the superficial plexus, from thence involving the deeper tissue.

Changes in the collagenous tissue, except as it is replaced by granulation tissue, are not regular and are often so slight that they are not worthy of comment. In viewing a series of lesions from a given number of cases I found that ordinarily the changes were not sufficiently well marked to be of any practical diagnostic aid. Nevertheless, both hypertrophy and atrophy of the connective tissue, as a result of vessel changes, do occur. An instance of the latter was reported by me in a case of symmetrical cutaneous atrophy with the coincident development of syphilis of the skin and nervous system,[5] the alterations in the vessels' walls (Fig. 8) and the perivascular infiltration pointing strongly to these structures as the primary seat of the trouble. Or a productive interstitial inflammation may be secondary, which is illustrated in the accompanying photomicrograph (Fig. 9) of a syphilitic laryngitis, the larynx having been extirpated under the mistaken diagnosis of a malignant growth.

It is not uncommon to find an epithelioma developing on a syphiloma (Fig. 10), especially about the oral cavity. The epithelial hyperplasia is probably brought about by irritation, increased hyperemia, as well as by changes in the underlying connective tissue permitting an epithelial downgrowth.

5. Jour. of Cutan. Dis., April 1904, xxii, 255.

Coming to the vascular system, in all the lesions except the macule the reaction is marked, being of greatest severity in the late secondary and tertiary stages of the disease and showing all grades from swelling of the endothelium to proliferation of all the coats and obliteration of the lumen. It is very likely that there are two processes, one taking its origin in the adventitia and the other in the intima, possibly simultaneously, or, as investigations on the cerebral arteries suggest, independently of each other.

Hansemann[6] is of the opinion that the syphilitic virus has a special predilection for the endothelial cells, whether of the endocardium, large or small arteries, veins or lymphatics; all the rest may be involved secondarily. To the vascular changes may be attributed the formation of giant cells so frequently encountered in the nodular and tubercular syphilide and in some of the early secondary papules. It is rare to find them in gummata, and it has not been my experience to find them in initial lesions, although Unna and Rieder claim to have done so. They appear to be a more constant feature of the tubercular and serpiginous lesions, in which they are often present in groups. In many instances it is simple enough to trace their formation to proliferated endothelium and thrombosed lumina. In others it is much more difficult to establish such a relationship, but if sections in series are studied it is demonstrable. The type most frequently met with is the Langhans with peripheral nuclei; the myeloid with central nuclei occasionally. In one case a double row of nuclei appeared whose formation it was difficult to explain.

Giant cells of specific lesions differ from those found in lupus in being less completely formed, in showing in many instances only a partial thrombosis and in their irregular nuclear multiplication, suggesting that the process is a more acute one. As they are more numerous in serpiginous than other lesions, it has occurred to me

6. Trans. V. Internat. Derm. Kongress, Berlin, 1904, p. 205.

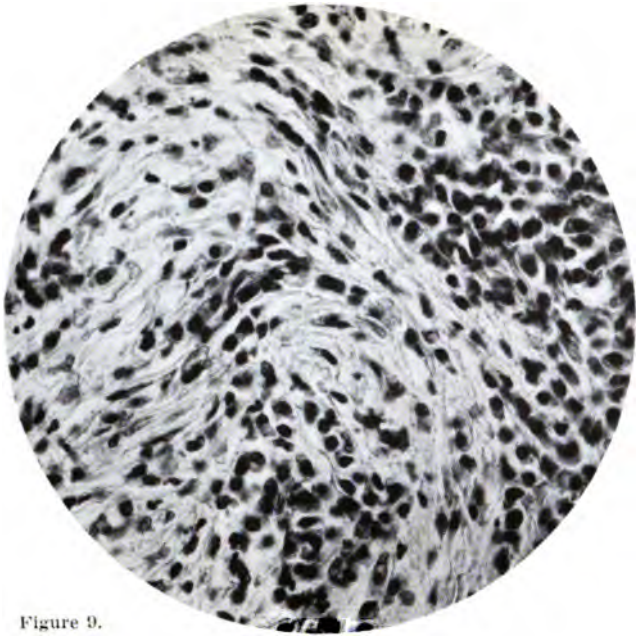

Figure 9.

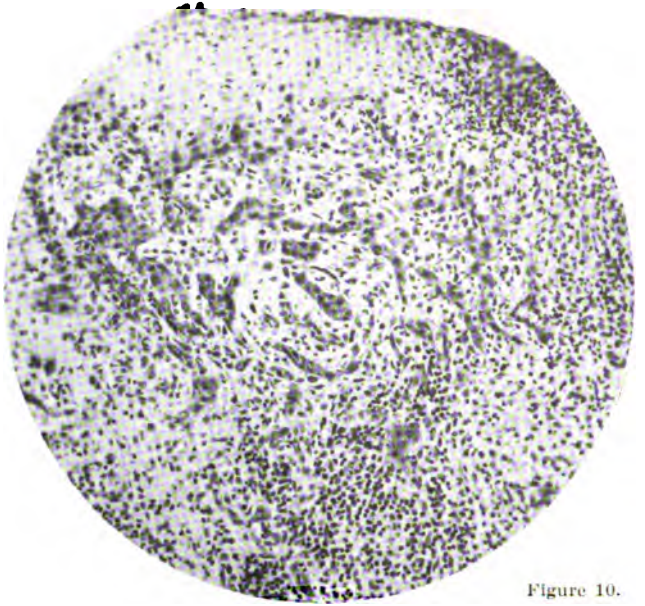

Figure 10.

Fig. 9.—Syphilitic laryngitis. (Spencer ¼ in., comp. oc. 4.) A productive inflammation of the larynx, showing hyperplasia of the connective tissue and an inflammatory infiltration of round cells and large numbers of plasma cells. The vessels are the seat of an endarteritis or panarteritis.

Fig. 10.—Epithelioma developing on a syphiloma of the lip. (Zeiss 8 mm., comp. oc. 4.) One portion of the lesion shows an ulceration extending to muscle of the lip. It is the seat of an intense infiltration of lymphocytes, through which are scattered some plasma and many polynuclear cells. There is a marked increase in the blood vessels and some hemorrhage is present. A number of the vessels are dilated and filled with blood, their walls presenting no perceptible change. Others are simply thrombosed, or again, their walls are thickened and the lumina occluded by proliferated endothelium. Several giant cells with peripheral nuclei are traceable to vascular changes. At the edge of the lesion are seen fine processes of proliferating epithelium penetrating the derma.

that the extension of those lesions could be explained by the progressive thrombosis of the vessels. Many specimens support this idea, but especially one from a serpiginous lesion of the thigh (Fig. 11), in which the histologic findings consisted of foci of groups of thrombosed vessels with a moderate cellular effusion.

While apparently true of cutaneous syphilis, it is not intended to impute to metamorphosed vessels the origin of giant cells in all specific processes. Versé[7] found in arteritis syphilitica cerebralis giant cells in all layers of the vessel wall in one of his cases, but especially in the intima where they flanked the entrance to an aneurism and had an enormous number of nuclei. In other cases they were found in the necrotic media. He believed that many of them were foreign body giant cells. v. Baumgarten[8] has expressed the belief that the presence of giant cells in syphilitic processes indicated a combination of tuberculosis and syphilis, but in none of the cases that came under my observation was tuberculosis demonstrable anywhere.

The syphilitic products show a greater instability in some lesions than in others, as in the pustular, rupial and gummatous. In the two former, perhaps, the question of soil is the more significant, while in the latter the severe vessel alterations interfering with nutrition offer an explanation. The involution of the efflorescences is brought about by necrobiosis, fatty metamorphosis and caseation.

Recurrences in pre-spirochæta days were explained by Neumann[8] as due to the proliferation of cells which remained at the site of the original lesion. Now, however, the multiplication of remaining spirochætæ is invoked as the cause by Neisser.[9]

An important aid in the clinical diagnosis of syphilitic skin lesions is often rendered by the observation

7. Ziegler's Beitr., 1907, xl, 409.
8. Verhandl. der Deutsch. Patholog. Gesell, iii.
9. Die experimentalle Syphilisforschung nach ihrem gegenwärtigen Stande; monograph, 1906.

of the so-called pigmentary syphilide of the neck, which is occasionally seen either as a primary condition or as a sequel to a pre-existing erythematous or papular eruption. It occurs more often in brunettes and is an important corroborative evidence of syphilis after other manifestations of the disease have disappeared. Pigmentation in syphilis is favored by a cachectic condition of the individual and also by the presence of an old nephritis. In my service at the City Hospital it is not infrequent to see a syphilitic infection in a patient with an antecedent nephritis, in whom the development of pigmentation is a common occurrence and often very marked.

Recently Hoffmann[1] has ascribed to the spirochætæ a rôle in the diminution and increase of pigment in specific lesions. He found that in the areas invaded by the organisms the pigment in the epidermis was entirely lacking or very much reduced in amount. This depigmentation he considers the result of a local action—the body toxins—of the spirochætæ. The deeper marginal pigmentation surrounding spots of leucoderma is probably brought about by their peripheral progression, which occasions at first an increase and later, by intensity of action, a disappearance of pigment. The diffuse bronzing of the skin, seen especially about the neck, he believes to be due to the action of the spirochætæ on the suprarenals, for which they appear to have a special predilection.

The conditions from which syphilis is to be differentiated are tuberculosis, lichen scrofulosorum, blastomycosis, leprosy, epithelioma and drug eruptions. It often requires the minutest examination to draw a distinction between specific lesions and lupus, as exemplified in several specimens in my collection, notably a syphilide from the flush area of the face (Fig. 12) and another from the back of the finger. The latter had been diagnosed clinically as a lupus. The following points may serve as a guide: In syphilis there is a greater degree of

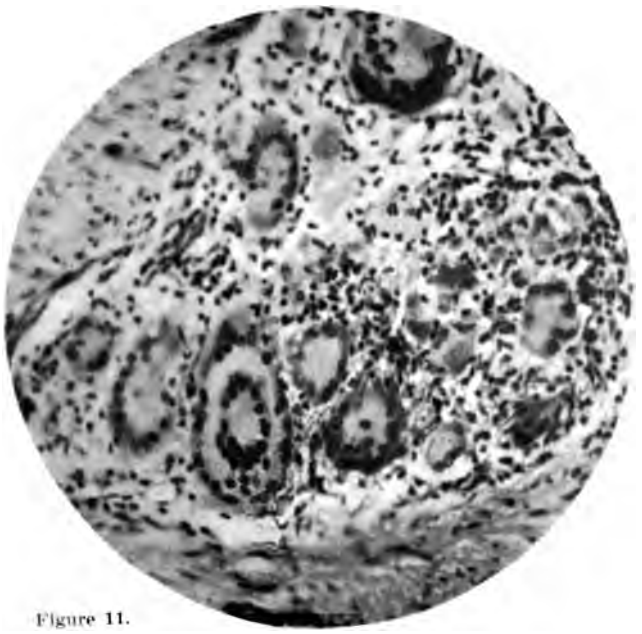

Figure 11.

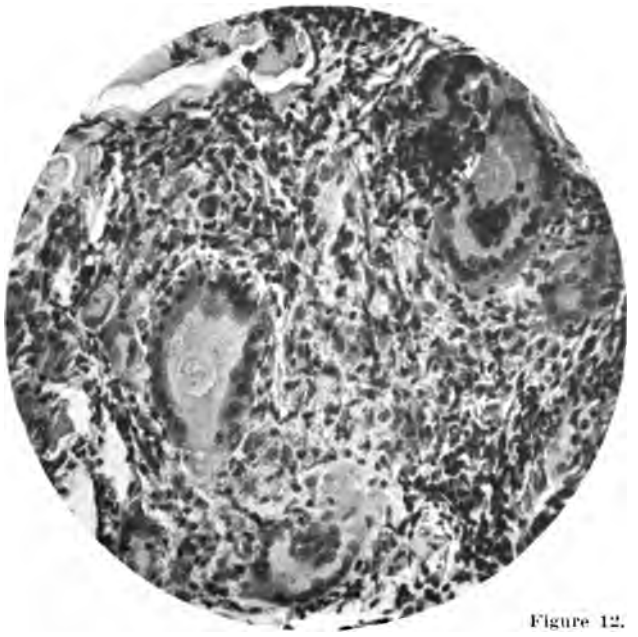

Figure 12.

Fig. 11.—Serpiginous syphilide of the thigh. (Spencer ¼, projection oc. 2.) A group of vessels giving rise to giant cells, one of which shows very distinctly the double row of nuclei. The surrounding infiltration is composed of round, plasma and connective tissue cells.

Fig. 12.—Late syphilide of the nose simulating hypertrophic lupus. (Spencer ¼ in., projection oc. 2.) A section through an area containing a group of capillaries which have been completely obliterated and present the appearance of giant cells. The connective tissue is increased in volume and pervaded by fibroblasts, round cells and plasma cells.

proliferating endarteritis and other vascular changes; many of the giant cells are incomplete and can be traced to the vessels, and progressive and retrogressive changes are more rapid than in lupus.

The small follicular lesion presents a picture so closely resembling that of lichen scrofulosorum that it can scarcely be differentiated from it microscopically, and we are obliged to take into consideration the clinical features, as the age of the patient, the presence of concomitant symptoms of syphilis and the absence of scrofulosis.

In blastomycosis and leprosy it is such a simple matter to demonstrate their respective organisms in the tissue that the histologic changes are of secondary importance. Epithelioma is readily excluded by the presence of an epithelial growth in the corium.

The most frequent drug eruption that comes into question is the bromid, the lesions of which present epithelial hyperplasia with miliary abscesses and a diffuse infiltration of round and polynuclear cells, often with eosinophiles through the derma. Giant cells and vascular sclerosis are lacking.

All clinicians have observed that certain specific lesions yield to treatment with great facility, while others are obstinate in their response to therapeutic measures. It does not seem possible from ordinary histologic examinations to offer any explanations or draw any conclusions as to why this is the case. It may be that in one the spirochætæ are more malignant and in another the resisting power of the patient lowered. On the other hand, the reason may be sought on anatomic grounds, the implication of certain structures, as the vascular apparatus, for instance, where proliferation may interfere with the permeability and absorption of the therapeutic agent. However, these are simply hypothetical questions for which as yet no satisfactory solution is offered.

DISCUSSION.

DR. A. RAVOGLI, Cincinnati, said that, although the alterations in the blood vessels produced by syphilis have been well recognized, it is difficult to understand how they are affected in that way. We do not know whether the blood, carrying the spirochætæ, affects first the intima or the adventitia. He has come to the conclusion that the adventia is first affected and then the intima, probably not from the spirochætæ in the blood current, but from the spirochætæ carried to the tunics from the lymph-vessels. He has been fortunate enough to secure one very fine specimen showing two spirochætæ just inside the adventitia surrounding the vessels. He was unable to photograph these small micro-organisms. The examination of the specimens of syphilitic tissues all show the tendency of the tissues to hyperemia and proliferation, the same as is found in leprosy and tuberculosis. He believes this peculiar proliferation to be the result of irritation produced by the presence of the spirochætæ in the connective tissue.

DR. W. H. MOOK, St. Louis, emphasized the difficulty of distinguishing between tuberculosis and the tertiary lesions of syphilis. He had in mind the two cases under Dr. M. F. Engman's and his own care of the frambesial form of syphilis, in which the diagnosis of tuberculosis verrucosa cutis or syphilis could be made. Sections showed typical plasma and giant cells, and it was only after two months of anti-syphilitic treatment that the diagnosis of syphilis was decided on. Dr. Mook said that the differential diagnosis by histologic methods is sometimes very difficult in these cases, especially where there is any complicating infection.

DR. W. G. GOTTHEIL, New York City, said that he had seen very few photomicrographs equal to those illustrating Dr. Fordyce's paper. The usual picture of a syphilitic lesion bears such a close resemblance to so many other things, he said, that work of this kind, which gives us some definite data for the recognition of syphilitic lesions, is especially valuable.

DR. M. B. HARTZELL, Philadelphia, said that the difficulty in making a microscopic diagnosis between the lesions of tuberculosis and syphilis and some other infections is not to be wondered at when we recall that all these lesions are probably due to the presence of toxins in the blood. We formerly supposed that they were due to the direct presence of the micro-organism which is the cause of the disease, but we now know that the active agent in the production of most of the tissue changes is some toxin circulating in the vessels, and in consequence of this, the most striking changes are such as occur in the vessels themselves.

DR. CHARLES A. KINCH, New York City, said that we should look to the lymphatic system for the tissue changes produced by syphilis rather than to the blood vessels. The changes in

the blood vessels are secondary to those in the lymphatic circulation.

Dr. John A. Fordyce, New York City, said, in reply to a question by Dr. Schamberg, that to some of the types of giant cells in syphilis it is difficult to assign any origin. In other cases it is very easy to trace their development to obliterative changes in the vessels. The usual type seen in late syphilis is the Langhans giant cell, the peripheral nuclei of which are the proliferated endothelial cells of the smaller vessels, he has, however, encountered the myeloid cell in sections which could also be assigned to a vascular origin. He interpreted these nuclei as leucocytes entangled in a thrombus formation or endothelial cells which, through rapid proliferation, had lost their normal relations. In regard to the primary involvement of the blood or lymphatic vessels, to which Drs. Ravogli and Kinch referred, Dr. Fordyce said that in the early stages of syphilis, it is probably the lymphatic and in the later stages the larger blood vessels in which the chief changes take place.

TRICHOPATHOPHOBIA.*

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NEW YORK.

The subject of the pathophobias is such an extensive one and so particularly within the scope of neuropathology that my object is simply to classify those pertaining to the hair and to speak of some of the diseases of the hair and scalp giving rise to them. Under the term trichopathophobia, from θριξ, hair, πάθος, disease, and φόβος fear of, I wish to include all those cases of mental worry in regard to the hair, such as: Worry over the loss of hair or over the hair falling out; worry over the color or change in color of the hair; worry over a change in characteristics—brittleness, kinkiness, lack of gloss, etc.; worry over excessive growth in unusual places—hirsutes, hypertrichosis; worry over the failure of hair to grow where it should.

THE FEAR OF THE HAIR FALLING OUT.

The rôle played by the hair as a fetich of sexual attraction is so well known as to be consciously or unconsciously employed by both sexes. In the lower animals it is the male who parades his hirsute adornment as a means of sexual selection, and in savage races it is even to-day the male who most adorns his head dress. Civilized man has relegated this form of vanity to the female sex, although he is not entirely free from hair vanity, especially facial hair vanity.

The greatest number of cases of hair-worry is in

* I wish to thank Dr. Achilles Rose, well known for his writing on medical onomatology, for his interest and assistance in selecting the word "trichopathophobia" to describe these conditions.

women, and this is quite natural under modern conditions which makes them, as Bernard Shaw says, "superman" as regards sexual attraction. Hence the enormous amount of time and thought which women bestow on the arrangement and care of the hair. This is excusable on psychical grounds much more profound that simple vanity. The anxiety of a nervous woman at the loss of her hair is not at all reassured by the indifferent or stereotyped explanation of the physician that each hair has a definite growth, falls and is replaced by a new hair. Such women continue to worry until their anxiety in keeping daily count of the number of hairs lost at each combing may increase until it becomes a veritable obsession.

This worry, of course, is most marked in neuropathic women, but, since urban conditions are so trying to nervous stability, it is very common in society women. Women leading lives of social calls, teas, theaters, card parties, balls, late suppers and that constant *surmenage* which so often results in an enforced sojourn in a sanitarium. The following case may serve as an illustration:

Patient.—Miss X., aged about 39, fond of society, cultured, imaginative and pardonably vain of a heavy head of yellow hair.

History.—She came to me complaining of the serious damage which had been done to her scalp and hair while in a sanitarium for an attack of influenza. She stated that while in the sanitarium she had used some water in a bowl which had been brought from the kitchen and which must have contained some powerful chemical, since immediately after using this water her scalp began to burn. After a few days her hair began to change color, losing its gloss and becoming gray. The scalp became dry and scaly and the hair began to thin out. After some weeks another accident happened to her scalp from using some well-water containing lime and sulphur, as she had ascertained from a chemical analysis which had been made for her by a druggist. As a result of the use of this water her scalp burned as if something were eating into it. This burning lasted for about two months, the hair becoming thinner and grayer. Following this she gave a history of various mishaps

resulting from the treatment given her scalp by hair dressers, physicians and dermatologists. In one case the damage was caused by the use of a strong carbolized vaselin, in another case it was due to an ointment of resorcin and sulphur which had been used for a number of weeks only to find her hair becoming thinner and grayer. Finally she gave up the use of all treatment except olive oil and despaired of ever getting well—even feared she would lose all her hair. She was, at the time of consulting me, so suspicious of further damage as to be almost hysterical about allowing anyone to touch her head. Insisted on my hands being disinfected with bichlorid solution before touching her hair. She objected to any form of medication and said that she would allow only distilled water to be used for a shampoo.

Now what was the condition of her scalp at the time of her first visit? As far as objective appearances went it was absolutely normal. Her skin was thin, dry and subject at times to erythema and chapping. It was impossible to make an examination as to paresthesic areas or to find any definite ground for diagnosticating hysteria. But it was clearly evident that her loss of hair and the change in its color was more subjective than real and in any case more attributable to the result of the attack of influenza and the resulting neurotic condition than to what she had used. Nothing a physician might order for external use would be free from suspicion. The case was one for general hygienic treatment and suggestion. Unless such a patient's confidence can be gained it is useless to order any stimulating lotion, as all sorts of imaginary changes in the scalp and hair will surely be attributed to the local application.

I am indebted to Dr. J. M. Winfield, of Brooklyn, for the history of the following case, which bears many points of resemblance:

Patient.—Mrs. M., aged 35, a native of the U. S., and the mother of two children, 12 and 8 years of age, respectively.

History.—As a young girl and as a married woman she has been very proud of her hair, which was fine, silky and of a golden color and very abundant. Five years ago her hair began to fall out. She had not been ill nor was there any ascertain-

able cause. At first she paid but little attention to the hair falling, thinking it was natural, but later, however, on its continuing to fall, she became nervous and mentally depressed. I saw her a number of times. She gave the history of a spoiled child and wife; being rather pretty (of the doll type) the loss of hair made her melancholic. While she had lost quantities of hair she still had more than most women. From a condition of neurasthenia she has become almost a fit subject for an institution for the insane. She had lost flesh, did not eat, was suspicious of her husband's fidelity; would not go out during the day because "people made remarks" about her hair. She was more depressed when constipated and about the menstrual periods, and at times she had thoughts of suicide. Treatment by tonics, rest and proper outdoor exercise would stop the hair from falling, but the moment she became depressed the condition of the scalp was aggravated. No other hairy parts of the body were affected. There is nothing in the history (family or personal) that could account for the mental state, except that she was coddled and spoiled as a child and was allowed to be proud and vain.

In men the most frequently observed forms of hair-worry is in those who have acquired syphilis and who dread any slight increase in the loss of hair as an onset of that condition described in Timon of Athens, to "make the curl'd pate ruffian bald," as particularly to be dreaded from its revealing character.

This is especially the case in young men whose scalps are already affected with a mild steatoid pityriasis and who have paid little or no attention to the small daily loss of hair until, under the dread of specific manifestations, together with the toxic effect of the specific virus on the hair bulb, their worry becomes almost a monomania. Dr. Herman G. Klotz, in a paper[1] entitled "Remarks on Syphilitic Alopecia," emphasizes the points that loss of hair is not a common or regular symptom of the early stage of syphilis and that the slight loss of hair, which is constantly taking place in healthy individuals, as the result of the physiologic change of hair, continues its existence through and beyond the course

1. Read before the American Dermatological Association at Cleveland, June, 1906, Jour. Cut. Dis., 1907, p. 99.

of syphilis and must be taken into consideration before attributing to syphilis a loss of hair so slight as to pass unnoticed. In the discussion which followed, Dr. Robert W. Taylor said that he would classify the various types of syphilitic alopecia as follows: 1. Alopeciaphobia, by which he meant an ordinary *defluvium capillorum*, the danger of which was much magnified in the mind of the patient, who was afraid of losing his entire hair. 2. A shedding of the hair such as occurred in many adynamic diseases. 3. The moth-eaten, characteristic form of syphilitic alopecia occurring in spots. 4. An alopecia due to syphilitic lesions.

In these cases of hair-worry the patient should be told when there is an underlying steatoid pityriasis that this condition has nothing to do with the syphilitic process and will probably continue to cause a daily loss of hair even when the syphilis is thoroughly treated. In such cases an active local treatment will do much good. Many of these cases are not so entirely neurotic and it may be well at this point to briefly run over the causes of the hair falling out.

LOSS OF HAIR FROM GENERAL TOXIC CONDITIONS.

First, the loss of hair following febrile and severe constitutional diseases. The eruptive fevers, such as measles, smallpox, scarlet fever, have a more depilatory effect on the scalp in adults than in children, but all the severe infections, such as typhoid fever, pneumonia, pleurisy erysipelas, peritonitis, grippe, mumps and even appendicitis, may cause a considerable falling out of the hair. Labor, even when normal and unaccompanied by fever, may be followed by a diffuse alopecia. According to Sabouraud, in all these cases there is a period of about eighty-five days intervening between the exciting cause and the loss of hair.

Alopecia due to syphilis may follow in two or three months after the secondary rash, or thinning out of the hair may not occur before the fifth to the eighth month.

As a rule, this thinning out does not appear after the first year of the disease, but there is a form of syphilitic alopecia in patches which may develop in the second year of the disease. The typical specific alopecia in "clearings," as Brocq calls it, on account of its resemblance to the clearings in woods, occurs in the temporo-parietal and occipital regions and by its moth-eaten appearance is so pathognomonic that a diagnosis of syphilis may be often made from this alone.

General cachectic conditions due to tuberculosis, cancer, etc., also may act on the nutrition of the hair unfavorably and cause an alopecia. We have good grounds for considering all these cases to be due to the existence of a toxin in the circulation, a toxin which has a specific action on the hair bulb, and the extent of the depilation as well as the length of time before renewal of the growth varies with the severity of the disease causing the alopecia.

What are the grounds for this hypothesis? Experimentally, it has been shown that four doses of 0.08 gm. each of thallium acetate, a drug at one time employed to prevent the night sweats of phthisis, has caused a complete alopecia. This alopecia comes on fifteen to twenty days after absorption of the drug and appears first on the temples and back of the head and may progress in a few days to complete alopecia. Buschke[2] made a number of experiments on animals to see if the antagonistic effect of the thallium on the secretion of the sweat glands was the real cause of its producing alopecia. This theory had some plausibility, since pilocarpin, a stimulant of the sweat glands, has some reputation as an agent stimulating an increased growth of hair. He found from his experiments on animals that the antagonistic effect of thallium to pilocarpin on the sweat glands seemed to bear no relation to its depilating effect, but seemed to be due to some specific action on the hair bulb, and that the alopecia due to thallium acetate

2. Berlin Klin. Wochschr., 1903, xxxvi.

in animals, as in man, always began on either side of the median line of the head, face and back. He found also that external irritants applied elsewhere on the body could not induce alopecia away from this typical localization.

LOSS OF HAIR FROM LOCAL TOXIC CONDITIONS.

When we consider the loss of hair from local diseased conditions we at once encounter that great confusion of authors regarding desquamative and seborrheic conditions of the scalp. Sabouraud has marked off the boundaries of this confused group through his histologic and bacteriologic studies. According to Sabouraud, the chronic dry exfoliation of the scalp in fine branny scales, the ordinary dandruff, is caused by the growth of the spore of Malassez—the *"Flaschenbacillus"* of Unna. This microphyte, although uncultivable, is found deep down in the loosened-up horny layers and is not found in other conditions. This dry pityriasis resembles very much in its chronicity pityriasis versicolor, the causal agent of which, the microsporon furfur, although uncultivable, is never questioned. This dry pityriasis may last a lifetime without causing any marked loss of hair, but when it becomes greasy or steatoid the hair begins to thin out. This greasy condition may be due to one or both of two causes: a concomitant infection by the staphylococcus of porcelain-like growth, causing a serous exudation through the epidermic layers, or by the bacillus of oily seborrhea causing a hyperkeratosis in the mouths of the sebaceous follicles and a greatly increased flow of oil from the sebaceous glands, which chokes off and causes a shedding of the hair.

In man the process of becoming bald may be divided into three stages: First, the simple dry pityriasis or dandruff stage which in some individuals may last a lifetime without a marked baldness developing; second, that of steatoid pityriasis, in which the scales become greasy, more piled up and the hair begins to fall out

more diffusely in periods of greater or lesser activity. New hair may continue to replace those lost, but the condition may pass on into the third stage of oily seborrhea in which there is very little scale formation, but the scalp becomes very oily and the hair falls more and more abundantly, being replaced by more and more downy growth until the typical hippocratic bald head is constituted.

In women the process rarely advances beyond the stage of steatoid pityriasis. The real oily seborrhea in women is only found in women of a masculine type.

The loss of hair due to ringworm and favus may be omitted on account of its extreme rarity in adults. I have seen a number of cicatricial alopecia cases in adults among immigrants from Russia and Italy, but never in native-born Americans. Any dread of hair loss among immigrants is not due to trichopathophobia, but purely from the dread of not being able to pass the medical inspection for admission to this country. Postfuruncular and postimpetiginous alopecia, as well as Brocq's pseudopelade, or *alopecia cicatricielle,* may also be passed on account of extreme rarity in adults.

Alopecia areata, however, is a type of *defluvium capillorum* which may cause really marked cases of trichopathophobia. In fact, I have seen in private practice both men and women seriously upset mentally by this form of hair loss. In nearly all such cases the dread seems to be due to the fear that they will be suspected of having syphilis. While, as has already been mentioned, this alopecia in areas may result from syphilis, either acquired or hereditary, syphilis is by no means the usual cause. Chronic tuberculosis and some change dependent on the menopause is given by Sabouraud as occasional causes, but the most of such cases are due to unknown causes.

Sabouraud's claim of an underlying infection with the bacillus of seborrhea and Jacquet's theory of nervous origin from peripheral irritation, oftentimes dental irri-

tation, both seem to be insufficiently supported by facts. It is true that in all the cases coming under my observation there has been found a history of dental caries or toothache and that the cases always improved after the teeth were attended to, nevertheless, as local antiseptic and stimulating treatment was employed, I can not attribute all the good effect to the dental treatment alone. The frequency of alopecia areata is not at all in proportion to the great frequency of diseased teeth and other underlying causes must be sought for.

WORRY OVER THE COLOR OF THE HAIR.

This is not frequently met with, but certain shades of red seem to be particularly a cause of mental distress in young girls on account of the taunts of playmates. An amusing account of a peculiarly sensitive young man and his attempts to change the color of his red hair is given by Warren in his "Ten Thousand Pounds a Year." Through the use of various dyes and bleaches the color of his hair became as diversified as Joseph's coat, to the great chagrin, almost despair, of the hero.

WORRY OVER GRAY HAIR.

Worry is one of the usually given causes of prematurely gray hair. Cases of sudden blanching of the hair in one night are numerous and well authenticated. Metchnikoff[3] refutes the opinion often expressed that this whitening of the hair is due to the penetration of air bubbles into the hair shaft. The change of color, he says, is due entirely to the loss of pigment caused by the sudden activity of cells in the medullary layer, which he calls pigmentophages or, better, chromophages. These chromophages leave the medullary or central portion of the hair and attack and absorb all the pigment granules within reach in both cortical and medullary layers. These cells then either wander back through the hair bulb or may pass out through the hair itself.

3. Etudes Biologiques sur la Vieillesse, Ann. de l'Inst. Pasteur, 1901, 865.

Metchnikoff says, also, that these pigmentophages are most active at night and that it is quite possible for them to blanch a hair in one night. This theory is not easily reconciled with facts shown by ringed hairs or the colorless hairs which first come in on a patch of alopecia areata and which later become pigmented.

Worry over the hair becoming gray, while common enough, rarely becomes a monomania. In some neuropathic women, however, this dread of appearing old drives them to use hair dyes in spite of harmful effects. Brocq[4] describes such a case in a young American woman, neuropathic, prematurely gray, who, in spite of a severe dermatitis extending from head to foot which resulted from using a hair dye containing paraphenylendiamin, persisted in dying her hair until the last attack, attended by fever, required several months' rest in the mountains before recovery took place.

DERMATOPATHOPHOBIA IN HAIRY PARTS OF THE BODY.

Various forms of dermatopathophobia may have their localization entirely in the hairy parts of the body. These pruritic dermato-neuroses are common in users of morphin and cocain, and the dread is usually of parasites, such as pediculi, etc. Sometimes these unnatural sensations in hairy parts may develop into a *tic d'epilation,* or a mania for pulling out hairs. This trichotillomania is a morbid state constituted by pruriginous sensations in certain hairy parts of the body and an irresistible desire to relieve the distress by pulling out the hairs in the regions affected. The mustache is the commonest location of this tic in adults.

HYPERTRICHOPHOBIA.

Hypertrichosis, or worry over hypertrichosis, in young women is the most frequent and most serious form of trichopathophobia with which we have to deal. All dermatologists have seen such cases. In certain neuropathic young women this excess of facial hair becomes

4. Bull. Med., March 13, 1898, 230.

such a fixed idea that the health may be seriously damaged by the loss of appetite, anemia, anxious, sad or melancholic state. The aversion to society and almost constant preoccupation of the mind about their deformity may develop into insanity.

Winfield[5] found hypertrichosis in 78 out of 1,084 insane. "All but eight of these cases occurred in females. The eight men had thin and coarse beards, but their bodies were thickly covered with hair, especially marked over the spine. Twenty of the women had a copious growth of thick stiff hairs on their lips and chins. Most of the others had an unusually thick fuz all over their faces; all of them, however, had an abnormal amount of coarse hair over their bodies, thickest on the chest and back.

"One case illustrates how the mental condition seems to influence the growth of the hair; inasmuch as this appears to be unique, a full history will be given. The subject was a German girl, aged 24. Late in 1900 she had been admitted to the asylum suffering from an attack of acute melancholia; after six months she was discharged. Dr. Warren, who had charge of her, stated that while she was profoundly melancholic there seemed to be an increased growth of hair all over the body, especially marked on the face. She was readmitted in January, 1902, suffering from a relapse. Examination at that time did not reveal anything especially abnormal regarding the hair, except, perhaps, that she was a little more hairy than most females of her age.

"Her mental condition gradually grew worse until she went into profound melancholia. It was then noticed that the lanugo hairs all over the body were becoming thicker and stiffer. This change was most marked on the face, which rapidly became covered with a growth of fine blonde hairs, some being one-fourth to one-fifth of an inch in length. Her appearance at that time sug-

5. Dermatoses of the Insane, American Jour. of Insanity, 1903, lix.

gested a mild type of the 'Russian dog-faced boy.' After three months her mental condition slowly improved; simultaneously the superfluous hairs began to drop out, and on August 1 her face and body were as free from hair as when I first saw her."

I am indebted to Dr. Winfield for the history of a patient in his private practice who became insane on account of worry over hypertrichosis.

Patient.—Miss H. P., American, aged 20, large, well-developed girl.

History.—The girl had a high school education, but was unable to keep up with her classes on account of nervousness. At puberty (established at 14 years) a growth of fine hair appeared on the lip and side of the cheek. This troubled her so that she refused to go out, would not go to school, and spent most of her time crying. I was consulted regarding the removal of the hairs. She was unreasonable, had fixed delusions, obsessions, and in fact all the symptoms of insanity. The growth of hair on the face was just enough to unbalance the mind, which was already overworked. The parents had made an idol and fool of the girl, and the mental condition was the direct outcome of it.

If the hypertrichosis is very marked on the chin or upper lip or on the cheeks it becomes, of course, almost a vital question for the patient to have the hairs removed, but many of these patients are worried over a mere downy growth to an extent that is far greater than the actual deformity justifies. Such cases must be reasoned with or prevailed on by suggestion, with perhaps the use of hydrogen peroxid to bleach the hairs so as to be less conspicuous. The treatment of hypertrichosis by radiotherapy has not fulfilled its promise. Kienbock, Brocq, and Belot all agree that in the present state of our knowledge we are not in a position to produce a permanent alopecia with any degree of certainty, and in certain persons of great sensibility there is danger of producing permanent lesions, such as scarring pigmentation, telangiectases, etc., which are more disfiguring than the hypertrichosis itself. Electrolysis remains the method of choice.

While the influence of precocious, perverted or arrested activity of the sexual functions may be given as causes of hypertrichosis, it does not follow that such women are sterile, in fact pregnancy, by its profound modification of the organism, may cause such hypertrichosis to disappear as in the very interesting case reported by Hyde and Montgomery in their Treatise on Diseases of the Skin. This case is all the more instructive in showing the effect of internal ovarian secretion, since the patient, a married woman, 33 years of age, weighing 150 pounds, mother of three healthy children, stopped menstruating for more than a year and had been pronounced by an expert to be past the climacteric. She applied for relief with a well-developed beard and mustache. During two years, repeated electrolytic séances were given to remove the superfluous hairs. Menstruation became reëstablished and continued irregularly, even menorrhagic at times; the hirsuties entirely disappeared. A year later she again conceived and gave birth to a healthy boy, the hirsuties at that time being entirely absent.

I have seen a slight hypertrichosis of the mammary areolæ also disappear under the effect of a pregnancy and remain permanently away.

Dr. Sherwell, before the New York Dermatological Society, stated that a profound modification of the organism, such as pregnancy, had been observed to cure a generalized and intractable alopecia. The internal ovarian secretion has an undoubted effect in stimulating the growth of sexual hair and cases have been cited which show that in woman the disturbed condition of ovulation has both caused an atrophy of hirsuties and has apparently stimulated the regrowth of hair in a case of total alopecia.

WORRY OVER THE LACK OF BEARD.

That the internal secretion of the testicles should be lacking in cases of removal of the testicles or in cases of undescended or atrophic testicles, seems to be attested by

the absence of or scanty beards of such individuals. Quite naturally certain young men in whom there is a tardy appearance of beard worry a great deal over this lack of what they consider the badge of virility. Some of these cases, due to the above mentioned causes, are beyond relief, but suggestion and counter irritation may do much towards reassuring the worry over the absence of a beard in young men who, though having nothing the matter with the testicles, are comparatively devoid of beard.

LIQUID AIR IN DERMATOLOGY; ITS INDICATIONS AND LIMITATIONS.

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During the past year or more I have been particularly struck by the divergence of opinion expressed by my dermatologic confrères in New York respecting the value of liquid air in dermatology. In regard to its efficacy in some affections, there seems to be a general unanimity of opinion, while in others our opinions are strikingly at variance. This is the history of almost every new therapeutic agent, especially if it is a little out of the ordinary, and appears to be due, on the one hand, to a difference in the interpretation of its real powers and therapeutic properties and, on the other, to variations in the technic employed.

This is the position in which we find the *x*-ray to-day; there are few who understand it, hence the great difference in the effects produced and the results obtained. Sabouraud can use it in ringworm with a precision and uniform effect which no other can, apparently, approximate; it is possible that others can do better with it in other directions than he. While liquid air is simplicity itself compared to the intricate and complicated *x*-ray, may it not be possible that this divergence of opinion regarding even so simple a remedy is due to the fact that none of us really understands its powers and capabilities nor how to use it?

It is only by recording our personal experiences with a remedy and comparing the results obtained and technic employed that definite and uniform standards

can be obtained in any field. It is for the furtherance of this object that I propose to bring to your attention this short study on liquid air, and the experiences I have had with it in both private and hospital practice, during the past four years. Appreciating fully that this short period of time is entirely inadequate to enable one to judge of its ultimate and radical effects, its immediate and moderately remote effects have been so definite, in some instances, that I feel firmly convinced that we have here a remedy of real worth, in a limited field, at least. With it results may be obtained in some conditions that can not be approximated by other means at our command, and in one instance at least it was the means of arresting a malignant process that was destined, in a few months, to destroy the life of the patient. An agent which can do this, if only in one instance, certainly warrants our most careful attention.

Unlike other means at our disposal, unfortunately, it is not always to be had when most needed, and unless it becomes more generally used for experimental or scientific purposes than it is at the present day it can never take a permanent place in our armamentarium. Commercially it has been proved an impossibility, and our future supply for medical purposes must come from technical and scientific schools and colleges, where it seems to be essential, at present, for the proper carrying out of certain lines of investigation.

We will first consider—though in the briefest manner possible, and only such as are essential to the matter in hand—the varied and peculiar general properties of this agent, together with the gross effects observed on the tissues, in the form of a drop, the spray, or by means of the cotton swab.

GENERAL PROPERTIES.

Physical.—Liquid air is a colorless, odorless, effervescing fluid, emitting a vapor which looks like steam, moderate when quiet, but abundant on agitation or stirring. It is very unstable and must be kept in a loosely-

stoppered retainer to allow the escape of its component gases. It is of about the same weight as a given volume of water and has a temperature of 312 F. below zero. It feels dry to the touch and leaves no moisture on any surface with which it comes in contact.

Chemical.—Its component parts, chemically, are essentially nitrogen and oxygen, in the proportion, by weight, of about two and one-half parts of the former to one of the latter, together with a variable quantity of carbon dioxid; about one-eighth of 1 per cent. The nitrogen quickly bubbles away, leaving a liquid composed of almost pure oxygen, as demonstrated by its power to support combustion.

Therapeutic.—The effect of liquid air on bacteria was tested by Parks and White[1] in the Board of Health laboratories in New York some years ago both as regards the extreme cold alone, by incasing the germs in small tubes before immersion, and by placing them directly into the liquid air. Typhoid, anthrax and diphtheria bacilli were tested in tubes and were exposed from thirty to ninety minutes, and anthrax bacilli were immersed directly into the liquid air for over an hour. Pure cultures of all these were subsequently obtained from sterilized bouillon.

Huddleston[1] tested vaccine virus in the same manner and found, after fifteen minutes' exposure to the liquid, that its power to produce vaccination was not at all affected.

Parks[2] subsequently made further experiments in this same direction, exposing to liquid air almost every kind of germ life, from hay infusion to anthrax bacilli, in pure virulent cultures, for over two hours. It is reported that he found that liquid air killed 98 per cent. to 50 per cent. of these germs, from the weakest to the strongest. It killed 75 per cent. of typhoid germs, 50 per cent. of staphylococcus and 65 per cent. of diphtheria. He

1. White: Med. Record, lvi, 1899, 109.
2. White: The Journal A. M. A., xxxvi, 1901, 426.

states that a two-hour exposure does not completely destroy the virulence of any pure culture of these germs, but suspends their vitality for a long time, and that "they are only brought back to activity by the most careful handling and under the most suitable conditions."

Macfayden,[3] in 1902, tested its effect on bacteria extending over a period of six months, using for the purpose *B. typhosus, B. coli communis* and *Staphylococcus pyogenes aureus;* in addition to these non-sporing forms he tested a saccharomyces. These were all immersed directly into liquid air and tested from time to time; he found absolutely no impairment of their vitality. The typhoid bacilli retained their pathogenic properties and responded to the agglutination test; the colon bacillus retained its normal properties; *Staphylococcus pyogenes aureus* produced pigment on solid and an active hemolysin in fluid media, while the yeast retained its fermentative powers.

These laboratory experiments, although the results are not exactly uniform, demonstrate pretty conclusively that liquid air is incapable of destroying germ life, and it is reasonable to suppose it is incapable of more than inhibiting the activity of pathogenic organisms in the living tissues.

To explain the therapeutic properties of liquid air we must look, therefore, to changes in intracellular metabolism rather than to any bactericidal effect. Cell life is manifestly impossible in the prolonged presence of this agent, for the two chief essentials to living protoplasm, viz., heat and moisture, are here lacking. The sudden shock of its application contracts the blood vessels to the highest degree, but the normal temperature is soon resumed, although if frequently repeated a most powerful local stimulation is produced and ultimately endarteritis. The intense inflammatory reaction following its application causes a flooding of the lymph spaces with serous

3. A. Macfayden: (Proc. Royal Soc., Oct. 31, 1902) Abst. Med., News, Dec. 27, 1902, vol. lxxxi, p. 1215.

exudate, and to this is due its therapeutic effect in cutaneous cancer, some of whose disordered cells lie in these spaces in the periphery of the growth. By constantly inhibiting the activity of bacteria, in conditions known to be due to such invasion, their pathogenic power is nullified, for a time at least, thus allowing the inflammatory exudate to cope with them, the product eventually being carried off in the lymph stream.

It will thus be seen that liquid air is something more than a caustic, in the true sense of the word, for sloughing and sphacelation are not essential to the accomplishment of its therapeutic effects. I have seen this repeatedly exemplified in the treatment of vascular nevi and angiomata, and in new growths covered with a sound epidermis which was free from moisture.

GROSS EFFECTS ON HEALTHY AND DISEASED TISSUE.

With a full appreciation of the foregoing properties of this agent, it is easy to anticipate its gross and ultimate effects on healthy and diseased tissues, and its indications and limitations can be quite accurately defined. A drop on the sound skin causes a sensation of burning and tingling, and, if allowed to remain in contact a moment or two, will cause a blister. In the absence of moisture no slough nor death of tissue takes place, but on a perspiring skin contact immediately ensues, and a blister is quickly formed; on a denuded or moist surface, a slough with loss of tissue follows.

A mild and short exposure to the normal skin by means of the spray produces blanching, followed by a moderate congestion; a longer exposure thoroughly freezes and anesthetizes the part, but if not distally situated, as the ear, toe, finger, etc., the circulation is slowly restored without affecting its integrity. It is surprising to see how deeply and thoroughly a part may be frozen, either by the spray or by the cotton swab, without ultimately causing any injurious effects. It is a well-recognized fact that extreme degrees of temperature, either of

heat or cold, produce deleterious effects on the human organism, in proportion directly to the amount of moisture accompanying them. This property of dryness, therefore, explains the difference in effect of liquid air on the tissues, and much lesser degrees of cold as exhibited, for instance, in frost-bite.

In applications with the swab, the resulting inflammatory swelling varies in degree according to the amount used, the pressure employed, and the location and character of the tissues. If these are firm and well nourished it is often very considerable, while if ill-nourished or in a senile condition, irrespective of the age of the subject, a large dose will cause little or no reaction. These observations are important in the practical use of the remedy, for it enables the physician to confidently tell the patient just what he is to expect. All are more or less mystified by this curious fluid and are often much concerned to know just what it is going to do.

The pain accompanying its application is very slight and rarely lasts long, but in some cases, especially when in proximity to the teeth, it will produce excruciating pain referred to the teeth, sometimes enduring for an hour. In pathologic conditions it relieves pain after a few applications and lessens discharge and odor; it likewise diminishes tendency to hemorrhage, although there is always a surface oozing during the congestive stage, when applied to an open surface. Mild applications will encourage healthy granulation, while stronger ones will destroy exuberant growth. It produces very little, if any, reactionary effect on scar tissue, and in consequence of this property I have found it of distinct diagnostic value in epithelioma, an observation which will be referred to more in detail later on.

ITS INDICATIONS AND LIMITATIONS.

From what has gone before it would naturally be supposed that liquid air is destined to have a very wide range of usefulness in the therapeutics of cutaneous disease. If it were not for the fact that we already have

means at our disposal which are always accessible, that possess many of the properties of liquid air, and can fulfil its indications quite as well, or even better in many instances, this might be so. For local anesthesia, the treatment of abscess, bubo, boils, carbuncles, ulcers, warts and various other conditions in which extravagant claims were early made for this agent we have other far more convenient methods of equal or greater efficacy.

In pigmentary, hairy and vascular nevi, angiomata, lymphangioma circumscriptum, lupus erythematosus, lupus vulgaris and epitheliomata (unaccompanied by lymph-gland invasion), however, we have in liquid air a remedy which will often give us better results than we have been in the habit of getting by other means. I say often, rather than always, although the difference, I believe, rests wholly on the matter of technic.

TECHNIC.

Herein lies the kernel, as in almost every branch of practical medicine, but, unfortunately, perfection can not be attained. We can endeavor to approach it, however, and the nearer we do so the more uniform will be our results and, I believe, less divergent our individual opinions respecting the value of liquid air in dermatology.

For practical use liquid air is kept in what is called a "Dewar" bulb, which is a double bulb of glass, one blown inside the other, the space intervening being a vacuum. The surfaces of these bulbs are silvered, and this, together with the separating vacuum, retards the radiation of heat; the whole is incased in cotton wool or thick felt to prevent further radiation. These retainers are made in various sizes, but for office use one containing a liter is most convenient, and this amount, in ordinary room temperatures during the winter, will last six days. In summer it will not keep so long, unless it can be kept in an ice chest. A loose wad of absorbent cotton constitutes the cork.

The spray is obtained by inserting a rubber cork pierced by two glass tubes in the manner employed in the ordinary laboratory wash-bottle, the mouth of the entering tube being closed by the finger. I no longer use this method of applying the liquid, for it is difficult to accurately limit the area of exposure, and, furthermore, the field is constantly obscured by the dense and opaque spray, rendering it impossible to judge of the depth of its action.

The cotton swab is applicable to all conditions, and with a little experience can be used with great precision. Pine sticks of sufficient length to reach to the bottom of the retainer can be so shaped that the liquid may be applied in any quantity desired and to any shape or character of lesion. The end, which should be rather firmly wound with absorbent cotton, can thus be made flat, round, pointed or paddle-shape, as desired.

In making all applications the excess of liquid should be first shaken off, scabs should be completely removed from all lesions to be treated, and thin gauze must intervene between the applicator and all mucous or denuded surfaces, otherwise the swab will freeze fast.

The elements governing the effect produced are (1) the degree of saturation of the swab, (2) the accuracy of contact, (3) the amount of pressure exerted, and (4) the duration of the exposure.

On a thorough appreciation of these four elements, coupled with correct judgment respecting the interval allowed between exposures, which is a variable quantity according to the character of lesion and the effect of an antecedent treatment, depends wholly, I believe, our success or failure in treatment. The amount of pressure and its duration, granting the contact is accurate and saturation adequate, seems to be the keynote to the effect produced in any given application. This is the most difficult element to master and it is undoubtedly the most important. Of almost equal importance, however, is the correct judgment of the time to allow between

applications; this may be only a few days or several weeks; if made too frequently disastrous results will follow. As a general rule, the slower the method the better the result.

In some conditions, as lupus erythematosus and port-wine mark, a light pressure with the paddle applicator, of relatively short duration to produce a superficial freezing, is indicated. A second application to the same area is not made until the effect of the first has subsided. In this manner both conditions, if not too extensive, can be successfully removed in a shorter time and with a better cosmetic effect than by our old methods. In pigmented and hairy nevi, angiomata, lymphangioma and lupus vulgaris a medium pressure is indicated, and the same rule applies of waiting until the effect of one application is passed before making another; in treating individual nodules in lupus vulgaris, however, rather severe pressure with the pointed applicator is required.

In epitheliomata firm pressure of considerable duration is essential. In those of the ordinary size that occur on various regions of the face the pressure should be exerted at the periphery rather than in the center, or recurrences may be expected; the same interval rule applies here also. Exactly the same indications obtain for the superficial type of rodent ulcer. It is in this connection that the diagnostic value of the agent previously referred to is apparent. Formerly in curetting what seemed to be small pearly nodules at the periphery of a healed patch one frequently found some of them to be firm cicatricial tissue. Firm pressure with the liquid air applicator, covering several such, freezes only the diseased nodules, no visible effect being observed on the others; I have found it a most valuable aid in this capacity.

In treating indolent eroding epitheliomata very firm pressure is required, particularly at the hard rolled edge, and in this type it generally requires several applications

at intervals of two or three days before healing begins, but when once commenced the same rule of waiting before making further applications should be observed. In rapidly advancing fungating epithelioma the remedy should be used with a very bold hand until recrudescence begins, after which the interval applications should be adopted.

It is here that I have noted in more than one instance a very peculiar and misleading reactionary effect. In a day or two after an interval application a hard, raised, narrow, circinate and pearly border develops, resembling in every respect a typical active epithelioma. This entirely disappears in a few days and is undoubtedly a linear, hard blister formed at the periphery of an oversaturated swab. Were it not for the very sudden development of this condition one might be misled into making a second application, believing that the preceding one had only stimulated the growth; liquid air will do this, as in the case of ordinary caustics, if too mildly applied. In such an event an immediate severe application will usually arrest its progress at once, but in some cases it must be used in a most fearless manner in order to accomplish this effect.

The technic here detailed, based on and developed from an experience gained in the treatment of a fairly large number of cases, I put forth with a considerable degree of confidence, believing that by its careful observance uniform and satisfactory results may be obtained.

Some personal cases are here appended, a portion only of the total treated, but enough to illustrate the value of liquid air in a limited number of diseases and abnormalities. As nearly half of these were in private practice a good opportunity was offered of following most of them to the present time. Three only are at present under treatment, two hospital and one private case:

CASE 1.—*Nevus Pigmentosus.*—J. B., a private patient, a

woman aged 50, with a raised, pigmented, non-hairy nevus, elliptical in shape, with dimensions of a half inch by three-eighths, situated on the back of the neck. Three applications with medium pressure successfully removed it, leaving a smooth, whitish cicatrix, scarcely discernible.

CASE 2.—*Nevus Pigmentosus.*—A. R., a girl aged 16, another private patient, with a semi-fleshy, elevated, dark-brown nevus, circular, three-eighths of an inch in diameter, and situated on the left chest below the clavicle. One application with moderate pressure almost entirely removed it; a second lighter application completed its removal, leaving only a small pale spot to mark its site.

CASE 3.—*Nevus Pigmentosus.*—H. B., a 14-year-old boy in hospital practice, with a raised, dark-brown nevus the size and shape of a "butter-bean," situated on the forehead a half inch above the outer end of the right eyebrow. As the tissues were dense and resistant, moderately severe pressure was used, which produced a well-marked inflammatory reaction. The lesion scabbed and healed satisfactorily, but required two subsequent milder applications to complete its removal; the resulting scar was not depressed, and was only slightly noticeable.

CASES 4 and 5.—*Nevus Pilosus et Pigmentosus.*—L. G. and P. M., two dispensary cases, one in a young man aged 17, an elongated hairy mole, three-quarters of an inch in length, situated above the beard line on the left cheek; the other, a mouse-skin lesion, not quite circular, but of about the area of a dime, on the right side of the chin, in a woman over forty. The first was removed in five applications with medium pressure, a slight amount of the pigmentation being left, which successfully masked the smooth cicatrix resulting. Three applications, the first two with moderate pressure, the third a very mild one, were successful in removing the lesion on the chin, leaving only a small non-depressed cicatrix.

CASE 6.—*Nevus Vasculosus.*—M. G. This was situated on the nose of a woman, aged 40 years, a private patient, and was about the size and shape of a finger-nail. An application was made with sufficient pressure to produce a superficial caustic effect. This was done April 3, 1905, and on the 14th the thin scab that had formed had not fallen, but on the 25th, three weeks after the application, it had entirely disappeared; the scar was smooth and flat. She reported three months later, by request, and there had been no return; the result was apparently permanent.

CASE 7.—*Nevus Vasculosus.*—R. C. The lesion in this case was also situated on the nose, the subject being a dispensary

patient, a little girl of 11 years. It was irregular in shape and occupied over twice the area of the preceding case, a so-called port-wine mark. The treatment was begun Jan. 16, 1905, with light pressure applications, and eight of these were made covering a period of about two months. The patch became lighter in color after each application, and in less than three months from the beginning of treatment, nothing remained of it. A very superficial atrophic-looking scar marked its site. No change had taken place seven weeks later, when she reported for observation.

CASE 8.—*Nevus Vasculosus.*—N. H., a young woman, aged 38, a private patient, with an irregularly shaped vascular nevus, situated partially over the angle of the left ramus and adjacent part of the neck. The upper part had been treated by electrolysis leaving a somewhat pitted scar; the remaining patch measured about one inch in its longest diameter. Applications with moderate pressure were begun July 24, 1904. The first was made next to the old scar, but proved to be of little too long duration, as a superficial slough formed. Five other applications were made over the remaining area, covering a period altogether of seven weeks. At the end of two and a half months, none of the nevus remained. The scar was smooth and superficial; the first part treated was slightly depressed, but was perfectly smooth. The patient was seen two years later and there had been no return; the cosmetic effect was satisfactory.

CASE 9.—*Lupus Erythematosus.*—C. S. This patient, a woman, 36 years of age, had been treated at the dispensary for over four months with very little improvement. The disease had lasted three years and consisted of two characteristic patches, one on the left cheek near the wing of the nose, about the size of thumb-nail, the other on the right side of the bridge, a little larger in area. Three applications with mild pressure removed the patch on the cheek, while five or six were required to remove the other completely; the patch on the nose was more deeply infiltrated, being the older of the two. The resulting scars were smooth and quite superficial. She was carefully instructed to return if further troubled. Over a year has elapsed but she has not again reported.

CASE 10.—*Lupus Erythematosus.*—T. K., a man, a hospital patient, 42 years of age, with a patch a little smaller than a twenty-five cent piece, situated on the left temple; duration one year and a half. Six application with moderate pressure were made from time to time in this case, and the patch had almost disappeared when the patient was lost sight of.

CASE 11.—*Lupus Vulgaris.*—M. F. This was a private

patient, a girl of 13 years, with a patch nearly an inch in diameter, situated on the right side of the chin; it began as a small papule three years previously. A fairly severe freezing was done which caused considerable reaction. It sloughed and healed under a scab in about five weeks, but only about half of it had been destroyed. A moderately severe and two milder applications were subsequently made, resulting in its complete removal. The scar in this case was smooth and pliable, though slightly depressed. Over a year has now elapsed without any recurrence being reported.

CASE 12.—*Lupus Vulgaris.*—A. M. This is a very old case that I first saw at the hospital Feb. 18, 1895, in a woman then 53 years of age. She had a patch of lupus three inches in diameter on the right cheek, which was then of two and a half years' duration. I scarified it a number of times early in the course of its treatment, and it has been attacked in various ways since. On Jan. 23, 1906, there were five isolated tubercles remaining, the rest of the surface showing a surprisingly small amount of scarring. These were deeply frozen on that day with the pointed applicator; there was a great deal of inflammatory reaction, but they all disappeared. A week ago, sixteen months having elapsed, the patient thought one of the nodules was returning; it has become red and slightly raised, but it is not yet certain if it is diseased; if so, one application will undoubtedly cure it.

In the following series of fifteen cases of epithelioma, eight private and seven dispensary, there were twelve of that type commonly seen on the head and face. The other three were examples of the indolent eroding, superficial rodent ulcer, and quickly spreading fungating forms. They were all unaccompanied by lymph-gland metastases, the only type of cancer in which I consider this remedy is indicated:

CASE 1.—B. S., woman, aged 41, private patient. A scabbed quarter-inch size lesion, with pearly rolled edge, situated on the left side of the nose, between the bridge and the inner canthus. It began two years previously, from irritation by the nose-piece of her eye-glasses; there was the usual history of scabbing, healing and progression. One application was made with firm pressure Nov. 16, 1905. The crust fell off and it was healed in a little over two weeks. There has been no recurrence to the present time, over one and a half years; the scar is smooth and flat.

CASE 2.—M. M., woman, aged 28. private patient. A lesion

of the same character and size as that in the preceding case, situated in the middle of the right side of the nose; it followed the squeezing of a black-head two years previously. Application was made Feb. 27, 1906, and it was entirely healed in three weeks. Thirteen months later, two pin-head size recurring nodules at the lower border of the scar were again frozen. All was healed in ten days, a good flat scar resulting. I attribute this recurrence to the fact that a small piece of the original scab was inadvertently left attached to the lower edge at the time the first application was made.

CASE 3.—C. C., woman, aged 26, private case. The lesion in this case was practically a duplicate of the two preceding ones, but was situated on the bridge of the nose, and followed a traumatism three years previously. One application made April 10, 1906, healed it completely in fourteen days, a good smooth scar resulting. No recurrence to date, a period of thirteen months.

CASES 4, 5, and 6.—L. H., M. P. and M. T. These were three hospital patients, women, aged respectively 24, 59 and 44 years, all with lesions located on the nose, varying in size from a quarter- to a half-inch in diameter. The first was between the left inner canthus and the nasal prominence, and was ten months in duration, developing from a blackhead. The second was two years in duration, located on the right nasal wing, and developed from a mole. The third followed irritation by eye-glasses five months previously, and was on the right side of the nose near the inner canthus. They required one, three and two applications respectively, and smooth superficial scars resulted in all of them. They have not been heard from since and are presumably well, as special efforts were made to impress them with the importance of reporting in the event of any change.

CASE 7.—H. S., man, aged 40, private patient. The lesion was situated beneath the outer canthus of the right eye, was 15 years in duration, and developed from a flat mole. It was nearly circular, three-quarters of an inch in diameter, was covered with a scab, and had a rolled, hard, pearly edge. Applications were begun Jan. 5, 1904, four treatments being necessary to destroy the growth. It was all healed March 12, 1904, two months later, and has remained well to the present time, over three years; he visited me recently for another trouble and a smooth superficial scar marked the site of the old lesion.

CASES 8 and 9.—M. F. and J. P. These were private patients, a man aged 65 and a woman aged 70, both with lesions about the size of a dime, situated on the right cheek,

one near the eye, the other lower down. Both developed from flat senile warts, and were three and two years in duration respectively. One application made July 11, 1905, healed the first completely in about three weeks, and it remains well now, nearly two years later. The second required two treatments, Jan. 6 and 29, 1906; it completely healed two weeks after the second application and has not returned, after a year and a half. Good smooth scars resulted in both instances.

CASE 10.—M. R., a man, aged 70, dispensary patient. Lesion behind the left ear, three-eighths of an inch in diameter, six months in duration, and was supposed to have followed the bite of an insect. One severe freezing, April 24, 1905, healed it entirely in less than three weeks. It is now over two years and no relapse has been reported. The scar was a trifle depressed, but smooth.

CASE 11.—H. C., a woman, aged 25, a hospital patient. Typical epithelioma, one-quarter by three-eighths of an inch in diameter, situated on the left breast, one inch above and to the inner side of the nipple; it developed from an injury by a safety-pin one year previously. This was frozen twice, Aug. 15 and Oct. 21, 1904, and was entirely healed in sixteen days after the last application; no recurrence to the present time, nearly three and a half years. The scar was very slight.

CASE 12.—F. S., woman, aged 60, a charity patient. The lesion is located in the center of the forehead and began in a mole last summer. When the first application was made March 26, 1907, it was three-quarters by one-half inch in size. There are still two or three small nodules on the right side of a smooth scar; the case is awaiting another treatment, which will undoubtedly finish it.

CASE 13.—C. M., a woman, aged 72, a private patient, with a rapidly growing fungating epithelioma starting just below the vermilion border of the lower lip, in the median line. It began as a pimple, which was pricked and squeezed, and when first seen, July 20, 1904, six weeks later, there was a round hard growth, a half inch in diameter and elevated the same distance above the surface, slightly ulcerated in the center, with telangiectic vessels coursing over it. This rested on a densely indurated base one inch in diameter, easily felt from inside the mouth. The protruding growth was removed July 25 with acid nitrate of mercury, and the base was exposed to the *x*-ray two or three times a week, at the hands of another, for four weeks. The patient returned to me August 29, with a fungating growth involving almost the whole width of the lip, and extending inside the mouth. On the same day I applied a large Marsden's paste to the growth below the ver-

milion line, and the following day another. In seven days the slough came away, leaving a deep excavation. On September 7 the mucous surface was attacked with liquid air, and up to October 22, a period of six weeks, nine severe applications had been made. On October 26 a group of nodules developed on the right side of the chin, at a distance from the original growth; two more applications were made to these and the remainder of the original growth, making eleven in all, the last one being on November 29. On December 20, three months from the first application, all was perfectly healed, with an excellent scar level with the surface. The lip was slightly shortened, but the contour was not affected. She returned on that day to her home in a distant city.

On Jan. 8, 1906, thirteen months from the last application, she returned with a relapsing nodule the size of a pea, on the mucous surface, to the right of the median line. Two applications were made to this, but they were too mild and stimulated it to three times its original size. On January 29 a very severe application was made, freezing the entire thickness of the lip; this was successful, for on March 5 she returned home again, clinically, perfectly well. Strange to say, the contour of the lip was still preserved. There has been no recurrence to the present day, a period of fifteen months, or seventeen since the last application, and the patient is in her 75th year, a fine specimen of physical health.

CASE 14.—D. R., a woman, aged 40, a dispensary patient, with an eroding, indolent, and very painful carcinoma of fifteen years' duration, involving the left side of the nose and adjacent cheek and upper lip. The ala and a portion of the tip have been destroyed, the ulceration extending half way up the side of the nose and to the median line. It has a hard everted border and is devoid of granulations. She received the *x*-ray three times a week for the past four years, with, the patient says, no beneficial effect. Liquid air has been applied four times between Feb. 3, 1907, and April 1, but inability to obtain the agent has delayed its further treatment. The pain, however, is very much less, and the upper one-third has healed. I have every confidence that liquid air will eventually heal it.

CASE 15.—S. B., a man, aged 57, a private patient, with a superficial rodent ulcer of about ten years' duration situated on the right temple and forehead. It was successfully healed by the *x*-ray, but did not remain so, although there is a smooth but thin scar on the temple, three inches in diameter, free from active disease. When first seen, Dec. 5, 1906, the disease was active over the right eyebrow, in the form of a crescentic deep ulceration an inch long, extending parallel to it, and almost

exposing the periosteum. There was also an ulcer, three-quarters of an inch in diameter, over the zygoma, and a line of nodular lesions extending anteriorly from this, almost to the outer canthus. A third crescentic ulceration extended upward from this point, almost joining the one above the eyebrow. These have had, altogether, five applications from Dec. 13, 1906, to May 6, 1907, as a result of which all have healed except the ulcer over the zygoma, although this is half gone. The patient is still under treatment and I feel certain one more application will heal the small ulceration remaining. The result to date could have been accomplished in a third of the time had the agent been accessible when wanted and had the patient been more attentive.

It is hoped that the experiences here recorded have justified, in a measure at least, the conviction expressed at the beginning that we have in liquid air a remedy that is not without considerable value in a limited field in dermatology.

The results obtained in the first series of cases, including pigmented, hairy and vascular nevi, lupus erythematosus and lupus vulgaris are certainly better than we have been accustomed to get by our old methods in the same character of lesion. By this method such conditions can be removed with much greater ease and with very little inconvenience to the patient, while with proper care a minimum amount of scarring is produced.

In epithelioma, in the particular class referred to, it must be conceded, I think, that it is distinctly a power for good. It will take time and further experience to determine just all that it is capable of in this direction, but even now, it seems to me, it outranks some of the remedies on which we have placed great reliance. It is generally admitted that excision is not so effective in cutaneous epithelioma as the caustic, or the curette and caustic, for the flooding of the surrounding lymph spaces reaches the outlying cells which the knife can not. It has been shown that liquid air can do more than an ordinary caustic; logically, then, it should take a high place among them.

The *x*-ray will sometimes heal them, but they are prone to recur, and on a recurrence it is often ineffective. With better technic recurrences after liquid air will be, I believe, less likely, but on these it is as effective as on the primary growth. The cosmetic effect is equally good in both, but it is to be noted that no danger attaches to the use of liquid air either to the operator or to the subject. Finally the matter of time and trouble to the patient should be a consideration, and in treatment by liquid air these are greatly minimized.

DISCUSSION.

DR. H. W. STELWAGON, Philadelphia, said that he had the pleasure, a few years ago, of seeing Dr. Charles T. Dade demonstrate this method in New York, especially in cases of angioma and lupus erythematosus, in both of which affections there is need of new methods of treatment. In the treatment of angiomata, electrolysis has not proved very serviceable; it very often fails, repeated operations are often necessary, and the treatment is very painful. The usual methods of treatment in lupus erythematosus are also unsatisfactory, although in some cases the results are fairly good. Those cases in which we do get results are the ones where the disease has remained stationary, has shown no inclination to spread, and in which one is justified in using superficially destructive applications. In the cases of angioma and lupus erythematosus treated with liquid air, there was very little scarring, which, he said, is also a strong argument in favor of this method of treatment.

DR. WILLIAM A. PUSEY, Chicago, stated that the effect of liquid air depends on the fact that it produces almost instantaneous freezing. The objections to it are that it is commercially unobtainable, and is difficult to preserve. After witnessing the demonstration nearly two years ago by Dr. Dade, it occurred to Dr. Pusey that a good substitute for liquid air would be liquid carbon dioxid, which is obtainable anywhere. On investigation, he discovered that the commercial liquid carbon dioxid is liquified under a pressure of about 800 pounds, so that it is not in liquid form at atmospheric pressure, and that when it is withdrawn from a drum it evaporates so rapidly that it freezes into a snow very much in appearance like ordinary snow. Liquid air has a temperature of about —180 degrees C., while solid carbon dioxid has a temperature of about —90 degrees C. Liquid air, therefore, is twice as cold, but both will produce almost instantaneous freezing, and Dr. Pusey was not sure that the temperature of carbon dioxid snow is not better for therapeutic purposes than that of liquid air. In his opinion the usefulness of

both of these agents depends on the fact that they are destructive agents whose actions are readily controllable. One can produce an inflammatory reaction which will result in sclerosis, or one can produce destruction of the tissues with them; the effect produced depending on the duration of the application and, to a less degree, on the amount of pressure exerted. Dr. Pusey said that he gained the impression at first that one could produce sloughing with liquid air, but he has since learned that either with liquid air or liquid carbon dioxid one can destroy tissue as completely as with a hot poker. By timing the application of liquid carbon dioxid he has found that the effects can be controlled. With ten seconds there is a moderate reaction, with twenty seconds a fairly severe reaction with blister formation, and so on through longer exposures.

Dr. Pusey has used carbon dioxid in many cases of nevi, to a less extent in lupus erythematosus. In small pigmented nevi, his results have been the same as those of Dr. Whitehouse; the nevi have been removed without difficulty, leaving white pliable scars. He has also used it in one case of a very extensive hairy nevus, involving the face and forehead, in a girl 12 years old. In this case the nevus was covered with long hair, which was first removed by the Roentgen rays; then he began to work on the pigmented area with the carbon dioxid, and he has succeeded, practically, in removing the pigment. The case was demonstrated at a meeting of the Chicago Medical Society and the members present agreed that an equally good result could not be obtained by other means. In cases of vascular nevi the results are also good, but the application must be made with great care, because if the freezing process is overdone, it will result in a perfectly white ivory-like scar. In regard to lupus erythematosus, he demonstrated a case recently in which he obtained good symptomatic results. The lesions involved part of the face and forehead, and the treatment resulted in perfectly white, smooth, flexible scars; in fact, hardly scars at all. At one point there still remains a small area of suspicious tissue. Of course, nothing more is claimed than a symptomatic result, for, as is known, lupus erythematosus is an extremely capricious disease.

Dr. Pusey has not tried the method in the treatment of epitheliomata, except the very superficial lesions accompanying senile keratoses. Senile keratoses, and the beginning epitheliomatous infiltrations which occur with them, can readily be removed by liquid CO_2 much more readily than by other methods. Any amount of tissue can be destroyed with liquid air or with liquid carbon dioxid, so that epitheliomata can be treated successfully with these agents, but Dr. Pusey does not believe it is the method of choice.

He has applied liquid air on a few nodules of lupus vul-

garis, but not with success, undoubtedly, however, because his applications were not vigorous enough. In short, his experience with carbon dioxid snow corresponds exactly with that of Dr. Whitehouse with liquid air. If there is any difference in the results, he is unable to determine them from his description. Dr. Pusey believes the use of both the agents is distinctly worthy of trial.

Dr. George T. Jackson, New York City, has had a large experience with liquid air at the Vanderbilt Clinic, where Dr. Dade is one of the physicians, and he confirmed the efficacy of this agent, although it is often very painful. He has seen men and women cry with pain during the thawing out of the frozen surface. As regards the methods of applying the liquid air, he has found the swab the most satisfactory, using a sufficient amount of cotton to absorb the liquid. By the applications the tissues are first frozen stiff; then they thaw out and a blister forms which dries up and falls off, leaving a perfectly smooth scar. Liquid air is a destructive agent and will always leave a scar.

In lupus vulgaris he has not had much success with it, but in lupus erythematosus, he thinks it is the best thing we have, in spite of the scar that it leaves. But the disease always leaves scars. In all forms of nevus the result of the treatment has been excellent. In deep-seated angiomata it takes out the color, but does not remove the tumor. In port-wine marks the results have been less satisfactory, on account of the depth of those lesions. In epithelioma he has had practically the same results as those reported by Dr. Whitehouse.

Dr. L. Duncan Bulkley, New York City, has had considerable experience with liquid air. In some of the cases, the scars that were left could, he thought, have been rendered less noticeable with a better knowledge of the technic of the applications, especially in lupus erythematosus. He did not understand how Dr. Whitehouse could refer so lightly to the pain caused by these applications. He has known patients to complain bitterly of the pain after severe applications. With repeated and light applications, however, given at distant intervals, as Dr. Whitehouse recommends, one can readily understand that the pain would be comparatively slight.

Dr. James D. Gold, Bridgeport, Conn., has used liquid air to some extent in private practice. In one case of large vascular nevus in the temporal region and involving half of the eyebrow and both upper and lower lids, he made repeated applications, with very satisfactory results. The treatment has left a smooth white scar in the area where there was originally a large, bright red nevus. The patient in this case was a baby, and the treatments were commenced when it was 4 months old. The pain caused by the applications apparently was severe, as the child cried for two or three hours afterward. In cases of lupus erythematosus, his results have also been satisfactory. In one case an excellent result was ob-

tained after two applications. That patient also complained of pain. In another case of lupus erythematosus where the disease was of seven years' standing, the applications failed to arrest the spreading of the lesions.

DR. LEE S. SHONINGER, New York City, stated that one point in connection with this treatment is not entirely clear, and that is the question of scarring. Dr. Whitehouse had a resultant scar in almost every case. It would be of some importance, he thought, if Dr. Whitehouse would dilate on the character of that scar; whether it was atrophic or hypertrophic; the pathologic process involved in the formation of the scar, and also the macroscopic changes taking place in the interval.

DR. WILLIAM S. GOTTHEIL, New York City, stated that liquid air is a curiosity; we can not get it. Carbon dioxid, on the other hand, is obtainable, and, according to Dr. Pusey, it practically answers the same purpose as liquid air. Apparently these applications act by setting up an inflammatory reaction, and they cause scarring. Can not the same thing be done with any cauterizing agent? For instance, with trichloracetic acid, a very manageable caustic, one can produce an inflammation, with resulting superficial cicatricial tissue, just as with carbon dioxid.

DR. H. H. WHITEHOUSE, New York City, said he had simply referred to the manner in which the applications should be made if deep scarring is to be avoided. The ordinary scars left by the applications are perfectly smooth and pliable, and he has never seen hypertrophic scars result from its use. What the pathology of the process is, and what the changes are that take place during the intervals of the freezing, he does not know, as most of these lesions are on the face, and it would be difficult to get a section of tissue for examination. As to carbon dioxid, which has about one-half the coldness of liquid air, he thought that one ought to get from it about the results that we get from liquid air. In regard to the pain caused by the application; he stated that while he may have been misled in that respect by some of his patients, he does not think his observations, in the main, were far wrong. After treatment, he has always instructed patients to make cold applications, which apparently were soothing. The better nourished and the younger the patient, the greater the degree of reaction and the greater the pain. In some cases of rodent ulcer the patients scarcely felt the applications, and in none of the cases was pain a prominent symptom. In any event, it could readily be alleviated by the application of an icebag. The interval between the applications, to which Dr. Bulkley referred, is a very important factor in the treatment.

Generally speaking, it takes about a week or ten days, after a mild application, for the little scabs to fall off and the tissues to resume their normal condition. After severe appli-

cations, to an epithelioma, for instance, often four to six weeks will elapse before the good effect of an application ceases. In indolent, deeply eroding epitheliomas, several applications, at intervals of a day or two, are necessary to start the healing process, after which three to six weeks will often elapse before another application is needed.

As regards the treatment of deep-seated port-wine marks, his opinions are practically the same as those expressed by Dr. Jackson. In these cases such a deep-seated effect must be obtained that the resulting scar may be worse than the original lesion. The same is true of deep-seated lupus erythematosus, the type generally observed in long-standing cases.

THE PRESENT STATUS OF PHOTOTHERAPY.

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Since the epoch-making researches of Finsen, light therapy has been accorded an established place in the treatment of disease. Finsen and his disciples have conclusively proved the value of this agent in the cure of one of the most disfiguring and distressing of cutaneous maladies—lupus vulgaris. Not every patient with lupus vulgaris can be cured by phototherapy, but this treatment produces a larger number of successes and effects better cosmetic results than any other known procedure. The best results are obtained when all of the details of treatment are carried out in accordance with the teachings of Finsen. In the light institute of Copenhagen, which city has become the mecca of lupus patients, better results are obtained than elsewhere by reason of the skill of the physicians and the experience of the nurses. Treatment with the high power (50 to 80 amperes) Finsen arc lamps is not at all adapted to office use because of the size of the apparatus, the cost of the current, the duration of the individual treatments and the imperative services of a trained assistant. The same reasons militate against the successful operation of such lamps even in hospitals. In the city of Philadelphia there are not enough lupus patients to keep a large lamp going without great cost to the institution or to the patients. We have a large lamp in one of our hospitals in Philadelphia (Fig. 1), but it is only occasionally used. I

Fig. 1.—Large Finsen lamp in use at the Stetson Hospital, Philadelphia.

have been told that no New York hospital is now actually using the large Finsen apparatus.

Many efforts have been made to improve the construction of lamps so as to lessen the cost of operation and the duration of the exposures. With the possible exception of the Finsen-Reyn lamp, these efforts have been unsuccessful. Lamps of the Lortet-Genoud and London Hospital type (Fig. 2) and the iron electrode lamps treat a larger surface and cause more rapid reaction, but are decidedly lacking in penetrative effect.

THE BASIC PRINCIPLES OF LUPUS PHOTOTHERAPY.

The rationale of light treatment in lūpus vulgaris is based on three main propositions: (1) The property of certain rays of the spectrum to destroy micro-organismal life. (2) Their ability to penetrate the skin. (3) Their power to produce reactive structural changes. Success in the light treatment of lupus depends, therefore, on the ability of the rays to penetrate, to kill bacteria and to inflame.

The destructive effect of light on bacteria was proved as far back as 1876 by two English workers, Downes and Blunt, in an investigation most remarkable for its accuracy of detail. The results were confirmed by the researches of Arloing of Lyons in 1885. Numerous investigators, including Finsen, Bang, Bie, Busck, Freund, Strebel and others, have further proved the bactericidal influence of light.

Bang showed that unconcentrated light from a 30 ampere arc at a distance of 30 cm. will kill a surface layer of tubercle bacilli in six minutes.

The strongest bactericidal sun's rays are absorbed in the air, and thus an arc lamp has been found superior.

Dieudonné observed that bacteria were killed in half an hour by direct sunlight, in six hours by diffused daylight, in eight hours by electric arc light of 900 candle power, and in eleven hours by the electric incandescent light.

Other investigators have demonstrated that concentrated sunlight will check germ growth in one minute and kill bacteria in from five to seven minutes. Concentrated electric light checks growth of bacteria in from four to five minutes and kills in from fifteen to twenty minutes. Arc light from metal electrodes and the electric spark kill micro-organisms in from five to forty seconds.

Von Jansen demonstrated that a piece of skin inserted between the light source and the bacteria did not prevent their death when the thickness of the skin was 1.2 mm. and the exposure one and one-fourth hours. With 1.5 mm. thickness bacteria were no longer killed. Bacteria were weakened at a distance of 4 mm. in the tissues.

Busck killed pneumococci inoculated into the cornea of rabbits with light, and Nagelschmid destroyed tubercle bacilli experimentally inoculated into the skin of a guinea-pig.

On the other hand, Klingmüller and Halberstädter[1] claim that the Finsen light does not kill the tubercle bacilli deep in the tissues. They exposed pieces of lupus tissue for ten minutes to the Finsen lamp and then inoculated them into the peritoneal cavity of guinea-pigs. That the bacilli were alive was evidenced by the fact that tuberculosis resulted.

It has been demonstrated that the bactericidal effect of light is largely exerted by the blue, violet and ultraviolet rays. The most scientific experiments on this point were carried out by Marshall Ward, who broke up light by passing it through a rock-crystal prism and allowed the spectrum to be cast on an inoculated solid culture medium. He found that the bacteria-killing effect began first in the transition between green and blue, and was strongest on the border between blue and violet. Especially when electric light was employed the bactericidal influence of the light extended far into the ultra-

1. Deutsche med. Wochschr., 1905, No. 14.

Fig. 2.—London Hospital lamp in use at the Philadelphia Polyclinic.

violet region. The dominant ability of the ultra-violet rays to kill bacteria, which was first demonstrated by Ward, was independently determined by Finsen three years later.

More recent studies by Bie[2] have established the important fact that the blue-violet end of the spectrum does not exclusively possess bactericidal properties. He says: "I found that with the application of a sufficiently strong light all portions of the spectrum were able to restrain the growth of bacteria or to kill them. The red rays possess the weakest power; this power then increases as one approaches the ultra-violet end of the spectrum, where it is strongest." Four per cent. of the bactericidal effect was ascribed to the red, yellow and green rays, while the blue, violet and ultra-violet rays exercised about 96 per cent. of the effect. Red, orange, yellow and green act only after long exposures. Pure red requires one and one-half hours to produce a determinable effect on bacteria.

Some difference of opinion exists as to the manner in which the tubercle bacilli in the skin in lupus are destroyed. Finsen held that their death is due to the exclusive effect of the ultra-violet rays. This view is not universally concurred in, many German workers contending that they are destroyed by changes induced in the tissues by the light. Roux established the fact that light exerts an important influence on nutrient media. He showed that Arloing was in error in regarding certain spores treated with light as dead, and proved that they would grow when transplanted to a fresh unexposed medium.

Richardson demonstrated that the sterilization of urine by exposure to light in the presence of air is due to the formation of hydrogen peroxid. Dieudonné confirmed this observation and agreed with Richardson that the ability of light to kill bacteria is due to the formation in culture media of hydrogen peroxid. Kruse, who

2. Die Anwendung des Lichts in Der Medizin, Wiesbaden, 1905.

carried out the same experiments, did not regard the results as due alone to change in the media, but also to a direct action of light on the bacteria. Bie admitted that hydrogen peroxid is formed in many nutrient media on exposure to light, but claimed that bacterial death is more rapid in media in which no hydrogen peroxid can possibly form.

Downes and Blunt early suggested that the destruction of bacteria by illumination depended on an oxidation process and required the presence of free oxygen. Bie's experiments led him to the conclusion that the destruction of the bacteria is not an oxidation process in the sense that the presence of oxygen is a necessary condition. The stronger the light in the blue violet and ultra-violet rays the less does its bactericidal effect depend on the presence of oxygen, and *vice versa,* the fewer the chemical rays that the light contains the less able is it to kill bacteria without the aid of oxygen.

The researches of Hertel[3] are most interesting in this connection. Hertel claims that the short-waved rays of light (chemical rays) cause a splitting off of oxygen from the blood and cell plasma, much in the same way as oxygen is freed from plants by light, and that this process affects both the tissues and the bacteria.

PENETRATION OF THE RAYS OF SPECTRUM.

It has been shown that the penetrating power of the various rays of the spectrum is in inverse proportion to their bactericidal and chemical power. The red rays are the most penetrating and the ultra-violet the least.

Most of the efforts in phototherapy in the past have been devoted to securing deep penetration of the chemically active rays. Within the past few years the attempt has been made to increase the chemical activity of the penetrating rays. In 1900 Tappeiner and Raab[4] made the important discovery that infusoria can be sen-

3. Ztschr. f. Allg. Physiol., iv-v.
4. Münch. med. Wochschr., 1900.

Fig. 3.—Patient in Case 1. Alopecia areata of 14 months' duration cured with the uviol lamp.

Fig. 4.—Showing restoration of hair.

sitized to the action of certain rays of light by the addition to their nutrient media of certain chemical agents.

This work was confirmed by Dreyer[5] working in the Finsen Light Institute in Copenhagen. Dreyer demonstrated that the addition to the nutrient medium of a small quantity of erythrosin renders bacteria sensitive to the action of the yellow and green rays of light. The germs which ordinarily are not influenced or but slightly influenced are rendered sensitive much in the same manner that a bromid of silver plate is sensitized to these rays. The microbes thus sensitized may be killed by the passage through moderately thick layers of skin of light from the usually employed sources owing to the increased action of the highly penetrating yellow and yellowish green rays. The *Bacillus prodigiosus,* protected by a layer of skin 1.25 mm., was not killed by exposure to light for eleven hours; after being sensitized death occurred after twenty minutes exposure.

Animal tissues, such as frog's tongue, rabbit's ear, human skin, etc., were also rendered sensitive to the action of the yellow and green rays.

In the treatment of lupus the exposures are greatly shortened by sensitizing the tissues.

Later Tappeiner and Jesionek[6] employed, before exposing to light, a 5 per cent. eosin solution as a paint and also subcutaneously in the treatment of superficial epithelioma, lupus, flat condylomata, tuberculous ulcer, etc., with alleged good results.

Lenkei[7] found that blue and yellow rays penetrated the skin and connective tissue to a depth of from 1 to 2 cm. When no muscular layer was present traces of the blue rays penetrated to a depth of over 3 cm. A small portion of the light penetrated to 5 or 6 cm. even through the muscular layer, but this was exclusively yellow rays. The red rays could not be examined be-

5. Derm. Ztschr., 1903, x, No. 6.
6. Münch. med. Wochschr., 1903, No. 47.
7. Die Durchdringungsfähigkeit der blauen und gelben Lichtstrahlen durch tierische Gewebe, von W. Lenkei-Almadi Orvosi Hetilap, 1906, No. 27.

cause the ordinary light, sensitive substances are not changed by them, but Lenkei is certain that these last rays penetrate into the depths in larger quantities than the yellow. Five per cent. of the light consisted of blue rays and 80 per cent. of yellow and green.

Finsen and Jansen have compared the penetrating power of light from various lamps, namely, the Finsen, the Finsen-Reyn, the Lortet-Genoud and the Bang. They found that the two latter are distinctly inferior to the first two lamps when deep penetration was required.

It appears to me that these tests, which are based on the influence of light on silver salts, are open to error. It by no means follows that the chemical effect of rays of light on photographic plates is a measure either of the bactericidal power of the rays or of their ability to produce inflammatory changes in the tissues. I have found that an ordinary sixteen-candle-power incandescent lamp with a reflector will emit light which will pass through the skin, subcutaneous tissue and mucous membrane of the cheek and affect a photographic film in the mouth in thirty seconds (Fig. 9).

On the other hand, a light extremely rich in chemical rays (the uviol lamp) was unable to produce any effect in five minutes.

Photographic plates may be affected by the yellow and even the red rays, and these rays are the most penetrating.

Busck[8] found that red, orange and yellow rays passed through his hand and affected a photographic plate in five seconds. The blue, violet and ultra-violet rays from the same light source produced no effect on the plate in ten minutes. This will illustrate the comparative penetrability of the various rays.

HISTOLOGIC CHANGES.

The histologic changes effected in the skin by the action of light have been carefully studied by a number of

8. Mitteilung aus Finsen's Lys Institut, iv, 1903.

Fig. 5.—Patient in Case 4.—Alopecia areata of 10 years' duration treated without success with the London Hospital lamp. Areas of light erythema shown.

Fig. 6.—Method of using two uviol lamps in series.

observers, including Moeller,[9] Sack,[10] McLeod,[11] Schmidt and Marcuse,[12] Zieler,[13] Meirowsky[14] and others.

The findings are in general agreed on. There is a pronounced dilatation of the superficial and deep cutaneous blood vessels with exudation of leucocytes. Sack believes the first change to be a proliferation of the endothelial lining of the blood vessels. Meirowsky, working in Unna's laboratory, states that the light stimulates the epithelial cells and leads to nuclear division. After intense exposures degenerative changes in the epidermis may take place and the dead cells may be cast off through the formation of blebs.

The light also causes an increase in the number of connective tissue cells and a swelling of the collagen. At the height of the process the rete mucosum is thickened. Unna says that light makes the skin dense and harder, in that under the influence of the light the protoplasm is reduced to keratin. Moeller demonstrated the fact that light caused a hyperplasia of the epidermis and an abnormal cornification.

THE INDICATIONS FOR THE USE OF PHOTOTHERAPY.

The treatment of lupus vulgaris represents the dominant field of usefulness of light therapy. Nevertheless, there are other diseases in which light may be employed with advantage even though it does not supplant other methods.

Light would doubtless have been more used as an auxiliary therapeutic measure in many cutaneous diseases had not the suddenly established reputation of the *x*-rays cast a shadow of obscurity over the milder acting agent. The ability of the *x*-rays to produce rapid and profound changes in cells and tissues constitutes at the

9. Bibliotheca Medica, Part D, 11.
10. Muench. med. Wochschr., July, 1902.
11. Brit. Med. Jour., Oct., 25, 1902.
12. Arch. f. Derm., 1903, p. 323.
13. Derm. Ztschr., 1906, No. 1.
14. Monats. f. Prakt., Derm., April, 1906, xlii.

same time the advantage and the disadvantage of that treatment. When judiciously and carefully applied in properly selected cases the *x*-rays certainly represent a wonderful addition to our therapeutic armamentarium; but improperly used they are capable of doing harm, often irremediable harm. Light energy, on the other hand, while much slower and much milder in its effect, is a perfectly safe remedy. Patients themselves have discovered this difference and will often permit one to use light therapy while refusing Roentgenization.

The supplementary list of diseases in which phototherapy has been alleged to be of value includes lupus erythematosus, alopecia areata, acne, acne rosacea, flat vascular nevi, certain forms of eczema, leg ulcers, etc.

LUPUS ERYTHEMATOSUS.

In this disease, one of the most refractory of dermatoses, phototherapy may often be used with the happiest of results. Finsen's first report included thirty-one cases with eleven cures and ten patients still under treatment. Since then a larger percentage of cures has been obtained by him. Leredde and Pautrier mention twenty-three cases with eleven cures, many partial cures and three failures. Morris and Dore treated eleven cases with great improvement in seven. Hyde, Montgomery and Ormsby report a total of nineteen cases, with five cures, nine patients greatly improved, three with but slight improvement and one made worse. I have had several cures in lupus erythematosus of the vascular type; it is in this particular form in which phototherapy is apt to be useful. The *x*-rays are often valuable in the hypertrophic variety, whereas they are apt to aggravate the condition in the vascular type.

ALOPECIA AREATA.

This occupies a place among the diseases in which light therapy is indicated. Finsen, Forchammer, Jersild, Leredde and Pautrier, Sabouraud, Hyde, Mont-

Fig. 7.—Condition of redness two days after a radiation of 15 minutes' duration with the uviol lamp. One of the squares was kept under water during radiation in order to ascertain if the heating of the skin by the lamp during radiation had any particular effect. The two places did not differ in any respect. (Schott.)

Figure 8.

Figure 9.

Fig. 8.—Shadowgram of a triangular piece of lead on a photographic film in the mouth, the cheek in contact with the pressure lens of the large Finsen lamp (50 ampere current).

Fig. 9.—Shadowgram of a perforated piece of lead on a photographic film in the mouth, the cheek being one inch from a 16-candle power incandescent lamp, backed by a parabolic reflector. Exposure 30 seconds.

gomery and Ormsby, Kromayer and others have reported successes. Professor Kromayer of Berlin has had such remarkable results that special reference to them is deemed valuable:

Kromayer[15] uses an arc light with iron electrodes, without pressure lens; a current of from 15 to 25 amperes is employed. The exposures range from one-half minute to ten minutes for each area, at a distance of from four to ten centimeters. In some cases Kromayer claims that a regeneration of the hair is evident after the first exposure. On the second day new hair points are at times visible. At first this was not believed possible, but was confirmed by independent examinations. Kromayer treated thirty-three cases of alopecia areata, which he divided into two classes: The milder ones with a hair loss of less than half of the head, and the severe cases with hair loss greater than this or complete. The result in the thirteen milder cases was throughout good; nearly all were completely cured. In three, small bald areas were still present; in a few, relapses were noticed. Of the twenty cases of the second group thirteen were total alopecia and the other seven approached total alopecia in various degrees. Of these twenty patients only five were treated with negative results, only one of which was not a total alopecia; hair growth was stimulated, but the hair either ceased to grow further or fell out.

Summing up his results, Kromayer claims twenty-eight successes out of thirty-five cases. In the milder cases the results were all satisfactory. In the severer group there were five failures among twenty cases. Many of these cases had lasted for years and had been treated with all sorts of methods without results. One patient, for instance, was a woman of 50 years of age age whose hair loss was almost total and had dated back twenty-five years. After twenty-seven treatments the

15. Monats. f. Prakt. Derm., July 1, 1905..

hair was restored to normal condition except over the temples, where it is a little thin.

Kromayer concludes that the iron light at the present time is the best and surest remedy in alopecia areata.

The stimulating effect of the chemical rays of light on hair growth has been repeatedly observed in Copenhagen, where the bare arms of the nurses giving Finsen light treatment have exhibited increased piliary development.

HIGH-POWER INCANDESCENT LAMPS.

The much advertised high-power incandescent lamps have been viewed skeptically and not with much favor by dermatologists in general. The skepticism has doubtless been based on preconceived theoretical considerations. Subsequent experience may prove the lack of faith to have been well based, but in the light of newer researches as to the effectiveness of all rays of the spectrum, and as to the efficacy of heat rays, trial of such light sources by properly qualified and conservative men would be desirable. It will be recalled that Bie found that with the application of sufficiently strong light all portions of the spectrum were able to restrain the growth of bacteria or to kill them.

Audry and Krösing[16] have been enabled to heal venereal sores rapidly with heat rays. Holländer claims good results in lupus and chancres with his hot air treatment. Scholtz[17] believes that the heat rays in the Finsen treatment of lupus are by no means without effect. He is of the opinion that the chemical rays are absorbed in the superficial layers of the skin and that the death of the bacilli in the deeper layers is due to the heat rays.

MERCURY VAPOR LAMPS.

In 1892 and 1896 Dr. Leo Aarons,[18] a noted German electrician, demonstrated that a continuous electrical

16. Arch. f. Derm., xliii.
17. Berlin klin. Wochschr., 1904, No. 18.
18. Wiedemann's Annalen, 1892 and 1896.

current passed through a vacuum tube containing a certain quantity of mercury is capable of creating an arc and of generating an intensely bright light emitted by the incandescent mercury vapor. Peter Cooper Hewitt of New York improved this lamp and made it commercially practical. This light contains few or no red rays and is extremely rich in blue, violet and ultra-violet rays. The latter, however, are largely absorbed by the glass of the tube itself. To obviate this absorption of the most chemically active rays Dr. E. Zchimmer, working in Schott's glass works, produced a glass (said to be a barium phosphate-chrome glass) which is pervious to the ultra-violet frequencies and which, according to Schott, permits by far the greater portion of the short waves originated in the glass tube to emerge. These tubes, which are made of varying lengths, must be tilted to make the arc and to start the light.

The lamp made by Schott is called the "uviol" lamp, the name being a convenient contraction of the term ultra-violet. Another mercury vapor lamp made of quartz with a water-cooling jacket is made by Heräus of Hamburg. For several years these lamps have been in use in Germany.

Axmann[19] treated with the uviol lamp thirteen cases of leg ulcer with cures after a treatment of some weeks; some of these cases had lasted years.

Acute and weeping eczema, after a ten-minute treatment were alleged by him to be so far improved on the following day as to require no further treatment. Acne, furunculosis and alopecia areata are also said to have been cured.

Hans Meyer[20] found that the uviol light acted on photographic paper through a piece of epidermis of a thickness of 0.5 mm. in three-fourths of a second at a distance of 1.5 mm. (The epidermis was taken from bullous lesions.)

19. Deutsh. med. Wochschr., 1906, p. 583.
20. Einige Erfahrungen mit der Uviol Lampe, Med. Klinik., September, 1906, p. 990.

Keller determined that the uviol light had a bactericidal influence, but acts only superficially. Plates exposed immediately after inoculation were affected, but later growth was not influenced.

Meyer had no success in ringworm of the skin, but secured favorable results in tinea versicolor. He believes that the uviol light, like the iron light, constitutes a method that surpasses others in the treatment of alopecia areata.

Meyer noted, as did Kromayer with the iron light, that fine hair tips begin to be visible after one treatment. That the light is the exclusive factor may be determined by comparing areas treated by the light with those that are not. He obtained good results in severe acne indurata. The acne nodules under the influence of the hyperemia undergo resorption.

In a case of bullous dermatitis herpetiformis Meyer obtained an apparent cure. The blebs dried up in a very short time under the influence of the light erythema. Excellent results were also obtained in the prurigo of Hebra.

Kromayer[21] considers the following indications for the use of the mercury vapor lamp (the author employed the quartz lamp made by Heräus): Lupus and superficial epithelioma, vascular nevus, alopecia areata, acne rosacea, eczema, rebellious syphilitic affections (psoriasis linguæ) and ulcers that are often refractory to ordinary general and local treatment. Kromayer obtained successful and sometimes brilliant results in isolated cases rebellious to all other methods.

Assfalg of Frankfurt[22] used the uviol lamp for one year. He believes that it is necessary to produce a light reaction in order to obtain therapeutic results. He treated three patients with alopecia areata and cured them with an average of fifteen sittings of from one-half to one hour in duration. The cases had lasted for at

21. Deutsh. med. Wochschr., 1906, No. x.
22. Muench. med. Wochschr., Oct. 9, 1906.

least a year and the patients had been treated in various ways without result. In several cases he saw extension of patches of alopecia areata on the border at the same time that new hair was growing in the center. He believes the hair returns more quickly under uviol treatment.

Acne was found to be very favorably influenced, Assfalg preferring the light treatment to the *x*-rays. A case of furunculosis of the entire back and chest of four years' duration and treated with various remedies was completely cured after ten treatments of from one-half to three-fourths hour in duration. There was no return within nine months. Two patients with chronic seborrhoic eczema were completely cured after five and eight treatments respectively. Two patients with acne rosacea were considerably improved after three treatments and are still under treatment. One is cured now for six months. A number of patients with chronic eczema, dry and moist, have also been cured.

Two patients with varicose ulcers were treated. One, the ulcer the size of a half-dollar, was healed after six irradiations, the other, still under treatment, was much improved after three treatments.

Gastou and Nicholas[23] report several patients treated with the Heräus quartz lamp; patients with lupus erythematosus, nodular tuberculid and glandular swelling were cured. The writers prophesied a great future for the lamp.

The uviol lamp has been employed in the Philadelphia Polyclinic for about a year. The breaking of the lamps interrupted the treatments, and some of the patients were obliged to be treated by other therapeutic measures. I have also used the uviol lamp in my office for some months. I have had constructed a tilting lamp-holder on a stand to receive two short tubes run in series and so arranged that the lamps could be used hori-

23. Bull. Med., 1905, No. 57, p. 668.

zontally or vertically (Fig. 6). Above the lamps is a reflector covered with aluminum paint.

With this lamp a light reaction may be produced after five minutes' exposure at 4 centimeters distance. Several times, after ten minutes' illumination at from 4 to 8 cm. distance, I have produced an erythema with some puffing of the eyelids. The erythema largely disappears at the end of twenty-four hours. The parasiticide properties of this lamp in my experience appear to be rather feeble. Petri dish agar cultures of the *Staphylococcus aureus, Bacillus coli communis* and the *Bacillus capsulatus aerogenes* were not killed after twelve minutes' exposure at 4 cm. with the Petri dish lid off. The cultures were about twenty-four hours old and it is possible that the effect of the light was insufficiently penetrating to kill the bacteria growing down into the medium.

I have used the light in alopecia areata, acne, eczema, lupus vulgaris and leg ulcers, but in entirely too few cases to justify any definite conclusions. I will briefly narrate the results and state my impressions:

CASE 1.—A. G., an Italian boy, aged 12, had an extensive alopecia of 14 months' duration. A partial regrowth at one time took place, but was followed by a subsequent loss of hair. The usual local remedies were used without much effect. About fifteen light treatments of ten minutes' duration, at a distance of from 4 to 6 inches, were given in the course of from six to eight weeks. The hair soon began to grow and is now fully restored over the entire scalp except at the nape of the neck, which received no illumination (Figs. 3 and 4). This fact strongly suggests the actual curative influence of the rays in this case.*

CASE 2.—J. F., aged 12, a robust blond boy with a total alopecia of nine months' duration. The usual treatment was entirely without avail. Under uviol exposures a fine down appeared, which subsequently vanished. Fourteen treatments were given, but without any successful result.

CASE 3.—M. R., aged 21, a young woman with a half dollar sized patch of alopecia in the right temporal region of two

* The patient has remained well now for five months.

weeks' duration. Three light treatments of from 15 to 20 minutes were given. There was extremely rapid restoration of hair. A stimulating antiseptic wash had been used and the cause of the unusually prompt result can not be definitely stated.

CASE 4.—In connection with these cases of alopecia areata, and bearing on Kromayer's successful results, it is proper to note a failure in the case of a 12-year-old girl with a total alopecia of ten years' duration. The girl was treated in the light laboratory of the Philadelphia Polyclinic with the London Hospital lamp. Thirty-two twenty-minute exposures were given without result. The accompanying illustration (Fig. 5) shows the light reaction in areas covered by the lens.

CASE 5.—T. S., man, aged 69, with damaged heart and kidneys and arteriosclerosis, had an extensive almost universal erythematous eczema of many years' standing. There was considerable thickening and lichenification. Itching was severe. Internal and local treatment of varied character had given no relief. The itching and infiltration were distinctly lessened by the light treatment. On the breakage of the tubes, *x*-ray treatment was substituted with more benefit than that derived from the light treatments. The patient is now vastly improved.

CASE 6.—M. M., a girl, aged 9, with a severe papular eczema of the face, hands and arms of several years' duration. Uviol treatments of fifteen minutes' duration were given twice a week. After four treatments, the itching was markedly diminished and the eruption greatly improved. Treatment was discontinued on account of breakage of apparatus.

Several cases of acne were treated, but inasmuch as these were private patients sole reliance was not placed on the light treatment. In non-suppurative papular or nodular lesions rapid resorption is effected by ten minute light exposures. The influence of the light is much more prompt but less permanent than that of the *x*-rays.

In several leg ulcers treated granulation was markedly stimulated by a few treatments. One severe case appeared to be on the road to cure, when the breakage of apparatus caused substitution of mild *x*-ray treatment, with immediate aggravation and extension of the ulcers.

In this connection the observations of Strebel are pertinent:

Strebel showed that ultra-violet irradiation of open wounds causes rapid granulation and skinning over. He explained this by the favorable action of the ultra-violet light on the blood vessels and trophic nerves. He recommended ultra-violet light in the treatment of leg ulcers.

Axman found uviol light of great value in leg ulcers.

In summing up my impressions as to the value of the mercury vapor lamp I should say that it appears most capable of accomplishing good in alopecia areata, leg ulcers and certain forms of eczema. The light is rich in chemical rays, but lacks deep penetration. These lamps have the advantage over others that a broad volume of light is emitted which can be conveniently applied over large areas. Another very pronounced advantage is that the grade of light erythema desired may be produced and even predetermined by the distance and duration of the exposure. The histologic changes produced by light have already been referred to; that a dilatation of blood vessels with exudation of fluid and corpuscles and regressive changes in pathologically altered cells occurs after the production of a distinct light erythema is evidence that in properly-selected cases such treatment may prove beneficial.

Such phototherapeutic measures are not to be regarded as panaceas but as aids to other approved agents in the treatment of certain cutaneous diseases.

DISCUSSION.

DR. W. S. GOTTHEIL, New York City, said that in a corner of his waiting room there stands a big apparatus containing a 60-ampere arc light—the American form of the Finsen apparatus—unused for many months. He employed it persistently for a long time, and did get results, some of which have been published; but he hardly uses it at all now. His experience can probably be paralleled by some of the members present. He knows of one case, at least, in which a very costly Finsen apparatus was imported, and, when he last heard of it, it

was still unpacked, owing to the amount of space that it required, and the time that its use would consume. In Copenhagen it may be possible to give daily treatments of an hour each for months at a time, but Dr. Gottheil's experience is that patients here will neither submit to it nor pay for it. Furthermore, the applicability of the method is limited. In alopecia areata he has obtained no results that were not attainable by simpler means. Some patients with lupus erythematosus were greatly improved and apparently cured, but some relapsed, and he has come to believe that one can never tell when this treacherous disease is ended. In lupus vulgaris the *x*-ray and ordinary mechanical methods of treatment are generally preferred. The Copenhagen results, according to all reports, are the best that have yet been attained in this disease, but there must be great simplification of the method and shortening of the time required before it can be used extensively here. So far as penetration of the body by light rays is concerned, Dr. Gottheil proved some years ago that a sufficiently powerful beam of light can be made to penetrate the entire thickness of the human body and print on a photographic plate. All the rays, even the ultra violet, can be made to pass through the surface of the body and reach the internal organs. A necessary condition, however, is to have a light beam of sufficiently high candle power; 50 or 100 candle-power incandescents are toys, not efficient therapeutic agents. A 30,000 candle-power arc ray, concentrated as much as possible, and cooled, from a 60-ampere current, is as small a light as should be used for action on anything deeper than the epidermis.

Dr. L. Duncan Bulkley, New York City, said that several years ago he went to Copenhagen, and, after a careful investigation of the Finsen method of treatment, became enthusiastic regarding it, and purchased one of the lamps. He had it shipped to New York, properly set up and wired from the street, with a special attachment to allow water to run through the lens. That was two or three years ago. He has used it in two cases of lupus, and for the past year or two it has remained untouched. He is still strongly in favor of the Copenhagen method of treatment, and if a bad case of lupus vulgaris, with lesions about the face, should come to him tomorrow, he would advise the patient to go to Copenhagen. Finsen's results, as shown at the dermatologic congresses, both in Paris and Berlin, were very brilliant, and Dr. Bulkley said that Dr. Hyde of Chicago is very enthusiastic regarding them. In Copenhagen Dr. Bulkley saw 150 patients treated, men and women who had had the disease for ten, twenty and even thirty years, and the results were simply superb. By the method pursued there the lens must be held over one little spot for an hour at a time, and afterward a salve is applied. A corps of nurses makes these applications, and some of the

patients have had as many as 600 or 800 of them, the treatment sometimes continuing over a period of from three to five years. The results obtained are better than he has ever seen by any other method of treatment, but he thinks that if the *x*-ray is used rightly, excellent results can be obtained in lupus. It is not so satisfactory, however, as the method followed in Copenhagen, and it is apt to result in scarring and burns. He has had little experience with the other forms of light.

DR. W. T. CORLETT, Cleveland, said that four years ago he visited Copenhagen and spent some time at the Finsen Light Institute, and saw many patients treated. He was impressed with the great care with which Finsen's assistants employed this method and by the benefit that was derived from the treatment, especially in lupus erythematosus and nevus. After getting better acquainted with some of the assistants, he learned that the consensus of opinion seemed to be that the best results are obtained in lupus erythematosus and vascular nevi. Like Dr. Bulkley, he became enthusiastic regarding the treatment, and made arrangements to have instruments and nurses sent to this country. He afterward visited Berlin and saw Finsen's apparatus employed, but the important details of the technic, such as the proper pressure and focus, were not observed. The results obtained were indifferent, and he believes the operators regarded it as an indifferent method. He then visited the clinic of Lange, who was carrying out two series of experiments, one by the well-known surgical methods, and another series by the Finsen light, but did not remain long enough to see the results of these experiments. He afterward saw a report in print that the light method has no special advantages over the ordinary surgical methods that Lange was using. In Paris he found that the Finsen light treatment is applied in an indifferent manner, but in London it is given as in Copenhagen, under specially instructed nurses. In short, the result of his tour of investigation made him somewhat skeptical as to any special advantage the Finsen light possesses over other less complicated methods, and he gave up the idea of ordering a lamp.

DR. J. FRANK WALLIS, Norristown, Pa., showed a hood, made of sheet iron, with an aluminum reflector, and which is attached to the ordinary arc lamp. From this lamp he can obtain intensely blue or violet rays, and with it he has from time to time treated small acne lesions. One advantage of this lamp is that the nearer the carbon, the stronger is the blue light. In addition to acne lesions, he has used it for small abscesses and sebaceous glands. There are also some cases of eczema that react very quickly to this light.

DR. M. L. HEIDINGSFELD, Cincinnati, said that he has used a Heraeus quartz mercury lamp with the greatest satisfaction. He said that, in his opinion, it possesses decided advantages over other instruments used in phototherapy, particularly in

the furuncular type of acne and in the treatment of small abscesses, on which it exerts an influence superior to any other form of light therapy that he has ever tried. In many of these cases he has used the *x*-ray and the London Hospital lamp, but mostly with indifferent results. He has also used a Kromayer quartz mercury lamp, and he has found the effects of this and the Heraeus instruments rather remarkable. They emit practically no heat at a distance of from six to eight inches, and, after an exposure of three or four minutes, they give rise to a decided bullous reaction. The effect of these instruments on certain forms of skin affections is striking and is almost remarkable in indurated and pustular acne; chronic forms of eczema and dermatitis, particularly infectious types, will be favorably influenced by a few applications of this form of light treatment. Cases of folliculitis and kerion, which resisted all forms of simple measures and rather prolonged *x*-ray treatment, yielded almost completely to one thorough application of this form of light energy. Some cases of lupus erythematosus, which baffle all other forms of treatment, *x*-ray and topical applications, have yielded very rapidly to this form of treatment. Others, however, have not been favorably influenced. Unlike Dr. Schamberg, he has not obtained any favorable influence from this form of treatment in alopecia areata, but it may be due to the fact that he did not push the treatment. In other respects his results do not differ materially from those of Dr. Schamberg, and he heartily endorses all the latter's favorable comments concerning this form of treatment.

Dr. J. H. Mudgett, Philadelphia, said that he has had considerable personal experience with light therapy, and he does not see how so many physicians, especially dermatologists, are so skeptical regarding it, and wonders whether or not they have any right to form an opinion about something they have never tried. With phototherapy it must be the same as with anything else; one must have experience with it before any opinion can be formed regarding it. Dr. Mudgett had five cases of ulcers of the leg last October which he treated successfully with an ordinary 500-candle power incandescent light, making hour exposures, and repeating the treatment every day and every other day. Some of them took two or three months to heal, but they were all long-standing cases—as long as ten years. In addition to the phototherapy he only used ordinary antiseptic applications, such as dermatologists recommend. In conclusion he suggested that dermatologists give this method of treatment a fair trial, in comparison with other methods.

Dr. Jay F. Schamberg, Philadelphia, said he believes that it is pretty well agreed that the treatment of lupus vulgaris remains the dominant field for phototherapy. Nevertheless, there are other dermatoses in which light treatment may be

found useful. There is a distinction between phototherapy and actinotherapy. The blue, violet and ultra violet rays are not the only frequencies capable of influencing tissues. It has been shown that there is real efficacy in heat rays in certain conditions. The high-power incandescent lamps should be given a trial by competent and conservative workers. Extravagant claims have been made for various forms of light treatment which can not be indorsed. It has been shown that the penetrative power of light rays is in inverse proportion to their bactericidal effect.

OBSERVATIONS ON PEMPHIGUS.

JOSEPH ZEISLER, M.D.
Professor of Dermatology in Northwestern University.
CHICAGO.

American dermatology has just cause for satisfaction in contemplating the present status of the pemphigus question, at least from a morphologic point of view. It is no longer necessary to mention dermatitis herpetiformis with an air of apology. Not only the French, under the leadership of Brocq, recognize in what they often term Duhring's disease, a clean-cut clinical entity; the English, German, Italian and practically all European dermatologists use that diagnosis continually; and even the Vienna school, obstinate until recently, has of late receded from its position to some extent. The keynote of this whole question is not one of nomenclature nor of classification. Too much printer's ink, I fear, has been wasted in this respect in the past twenty years. The advantage of narrowing down the conception of pemphigus to proper limits and using the term only in reference to more or less serious bullous affections with well-known clinical features and decursus, and separating from it that benign, pruriginous, chronic, relapsing, polymorphous dermatitis in which bullæ appear occasionally, but not necessarily always, lies largely in the fact that the way has now been paved for practical etiologic investigations and for therapeutic advances by international cooperation. As long as one observer has as an object for his histologic, bacteriologic and hematologic studies a true case of malignant pemphigus, while another has been working on a benign case of dermatitis

herpetiformis, contradictions and misunderstanding and general confusion must arise. A study of the literature of the past twenty years shows this in many instances; and one can not overcome a peculiar feeling of disappointment in comparing the enormous mass of papers and monographs devoted to pemphigus with its meager practical results. To illustrate, I might mention the reports of the Vienna Dermatologic Society, in which during the past twelve or fifteen years more than a hundred cases of so-called pemphigus have been demonstrated and discussed. Not a single word about etiology, not the feeblest therapeutic suggestion. Nothing but morphology, quibbling about diagnosis, continuous attacks against Duhring's views. And in this connection a doubt may be fairly expressed whether the imposing array of four hundred or more personally observed cases of pemphigus of which Kaposi could boast could pass muster under modern critical review. Or take Neumann's pemphigus vegetans, which most of us have long ago accepted as a distinct variety of pemphigus. Unna devotes his mighty pen to a fight for his new name, erythema bullosum vegetans. Then comes Tommasoli, who would rather call it condylomatosis pemphigoides maligna. And then still comes Hallopeau with his pyodermite vegetante. *Cui bono?*

A great deal of earnest labor has been devoted to the histology of the pemphigus bulla in recent times. Among the noteworthy workers in this line may be mentioned Luithlen, Kromayer, Jarisch, Kreibich, Grouven, Leredde and others. But there is far from unanimity in their findings as to the seat of the bullæ. The old view of Auspitz, who saw in a sudden disintegration of the prickle cell layer the chief pathologic process, and therefore called it an acantholysis, finds few subscribers now. According to the investigators mentioned above, the formation of the bulla varies in different cases, so that at times the most superficial strata only of the epidermis are elevated; in others the bleb is

formed by the separation of the whole epidermis from the chorium, and in others again it forms within the rete layers. No real light is thrown by these researches on the essential nature of the disease. This applies also to the otherwise interesting experiments of Weidenfeld, who succeeded in artificially producing large blebs on dead infantile skin under hydrostatic pressure.

The hope that modern bacteriologic methods might show in the contents of the bullæ some pathogenic organism has, as yet, not been fulfilled. Peculiar diplococci have repeatedly been demonstrated by Demme, Claessen, Bullock, Welch, Daehnhardt and many others in cases of acute infectious pemphigus, but not in true chronic pemphigus. What other organisms have occasionally been cultivated from the bullous fluid in typical cases of pemphigus are far from characteristic or pathognomonic. Nor has chemical analysis given definite results, and it would be useless to reiterate here the various findings in this respect. Some authors (Luithlen and Kromayer) have claimed a special dissolving or disintegrating effect of the bullous fluid on the surrounding epidermis in explanation of the peculiar phenomenon in pemphigus foliaceus, but this has been denied again by Jarisch and others.

In regard to the etiology, we find that the neurotic theory is still favored by many authors, though postmortem examinations have only very occasionally shown any morbid condition in either brain, spinal cord or peripheral nerves. Du Mesnil de Rochemont, in an able paper, after reviewing the various theories, describes five cases fully to prove their neurotic origin. Functional neuroses, hysteria, prick with a thorn are given as the causes. Such isolated cases as Kirchner's observation of pemphigus following the suppression of perspiration, or Guth's after exposure to intense solar heat, throw little light on the etiology of pemphigus in general. The same may be said about the theory of the osteomyelogenic origin of the disease, as is apparently demonstrated in

the case of Pelagetti, who found great numbers of large mononuclear leucocytes in the bone marrow.

Metabolic disturbances have been claimed since olden times, but the most careful urinary examinations have only occasionally shown an abnormal composition. Rather unique is Boeri's observation of peptonuria which accompanied the various bullous outbreaks in his case, disappearing in the intervals. Leredde urges the hematogenic origin of pemphigus, claiming that peculiar toxins are formed in the spinal cord and from there disseminated into the blood. Examination of the blood itself, however, while occasionally showing an increase in eosinophile cells, has as yet not helped the elucidation of that obscure problem. Grouven makes the startling proposition to consider as true pemphigus only such cases whose etiology is entirely unknown. Very suggestive is the explanation of Tommasoli and Sormani, who attribute chronic pemphigus to the effect of leucomains and the acute forms to microbic influences. This leads me to the consideration of an etiologic factor which seems to me to have a more than casual meaning, and for which I shall offer some observations of my own. I refer to the influence of organic animal poisons. Literature gives us a number of instances of this sort. In studying a case of acute pemphigus, Pernet has collated 16 cases of that variety, 8 of which occurred in butchers, while a few of the other patients had been handling animal products of some kind. Lassar has observed a case of pemphigus after poisoning by game. Herxheimer, in a study of pemphigus vegetans, cites 3 cases, one of whom was a fishermaster, another a cattle dealer, in whom the diagnosis first made was foot and mouth disease (mundsaeuche). Morley and Ransome report a case of bullous eruption in a butcher. Fabry's case occurred in a milk dealer. Sandby reports a case of acute pemphigus in a butcher, following a cut. Baerman reports from Neisser's clinic a case of general bullous eruption in a butcher. There were repeated attacks.

The bullous fluid was sometimes auto-inoculable, and the author considers his case as a chronic streptococcus infection.

Of special interest is Bowen's report of a case of acute infectious pemphigus in a butcher occurring during an epizootic of foot and mouth disease. He discusses fully the possibility of the identity of the two diseases, and furthermore parallels his case with the bullous eruptions following vaccination, of which Boston has had an epidemic at the same time when such an epizootic existed.

To these observations, which are probably only a small portion of all the reported cases, I can add two of my own; one a true chronic pemphigus, the other a pemphigoid bullous eruption.

CASE 1.—Dec. 3, 1903, I was asked by Dr. McGaughey, of Chicago, to see, in consultation, a patient whom he had treated for some time. On entering the patient's flat, I was struck by that odor peculiar to butcher shops, and soon learned that the husband was engaged in that trade. Mrs. S., a rather frail, tall woman of about 38 years of age, had suffered from bullous eruptions for several years. I found large, well-developed, tense bullæ with clear contents on an otherwise pale skin, situated mostly on hands and feet, but disseminated also on arms and legs and a few on the face and the trunk. The diagnosis offered no difficulties. The treatment consisted in the internal administration of arsenic, gentle opening of the bullæ, local antiseptic and astringent baths and washes. The patient remained under my observation for several years, and was shown to the Chicago Dermatological Society, particularly on account of a rather uncommon epiphenomenon, which, however, has been described by the elder Hebra and since by several authors as a somewhat characteristic sequence after the healing of the pemphigus blebs. I refer to the formation of multiple, milium-like, epithelial horn cysts, which in my case showed abundantly on the legs, hands and arms.

According to recent information, the patient is now fairly comfortable, but suffers from occasional outbreaks. The case may be considered as a rather benign form. The etiologic connection with the husband's occupation seems to be at least plausible.

CASE 2.—March 9, 1907, I was visited at my office by Mr. M., aged 27, occupation a butcher for ten years. He stated that for six years he had had each spring, with almost period-

ical regularity, acute eruptions of bullæ on his hands and feet, which usually lasted for about a month, and had caused him considerable suffering and inconvenience. He had never transmitted his trouble to any other member of his family. His general health had always been good, except that within a few weeks he had had his appendix removed. The present attack had come on within a few days.

I found his hands and feet literally covered with large, tense bullæ, just barely reaching over the wrists and ankles, respectively. The rest of the body was not affected. There was no fever present nor any other systemic complication. My diagnosis was erythema bullosum pemphigoides. Under simple treatment the patient recovered within a few days, and at my suggestion decided to abandon his occupation as a butcher.

I have no explanation to offer for the periodicity of the attacks in this case. Their causal connection with the handling of raw meat seems to me very highly probable.

I am citing this case without any desire to force it under the head of pemphigus, but merely to present another instance of the production of large bullous lesions anatomically and clinically identical with those of true pemphigus due—at least very probably due—to exposure to animal poisons of some kind.

Far from trying to give to my observations or those mentioned before any more weight than they may deserve, I believe we have here a large group of cases of bullous eruptive disorders, some of them of the acute, infectious, malignant type, others of a more benign acute form, yet others of the typical chronic form, all belonging together through a common etiologic factor. And one need not indulge in fanciful speculation to appreciate that probably many other cases, not necessarily in butchers, milk dealers and the like, do originate from meat poisoning or some kind of animal toxins.

In preparing this paper I have carefully looked through my records for the past ten years, and found therein notes of 14 cases of pemphigus. I believe it would be of little value to encumber this brief report by a statistical or detailed clinical account of all those

cases. Some of them proved mild and tractable; in others all my efforts to stem the fatal progress of the disease were in vain. One case, however, I may be permitted to briefly report on account of the peculiarity in its development and the rather favorable outcome after the presence of the features of true foliaceus pemphigus for some time.

CASE 3.—Mrs. I. N., 43 years old, of Evanston, Ill., visited me June 5, 1903, at my office, on account of a generalized eruption on the body, which I diagnosed as herpes tonsurans maculosus, as known to the Vienna school, and differing, in my opinion, from pityriasis rosea, with which, I believe, I am fairly familiar, though many writers consider the two to be identical. In other words, I had before me a parasitary eruption, due to the trichophyton fungus, which, from the statements of the patient, was probably acquired by infection from her own dog. Under energetic antiparasitary treatment the lesions disappeared within about ten or twelve days, but there gradually developed, at first, isolated and by and by more widely disseminated, large, bullous lesions. Such a development of pemphigus from an antecedent generalized eruption of some other clinical type has occasionally been recorded by other writers.

Without going into unnecessary details, I may state that within the next six weeks almost the whole surface of the body became involved, including the face and hairy scalp. Imperceptibly the type of the whole clinical picture had changed from that of pemphigus vulgaris to the clinical form of pemphigus foliaceus. There was little tendency toward the restoration of the epidermis. Instead, large areas of the surface were covered with crumbling, heaped-up masses of dry epidermis, desiccated serum and detritus. The chest and back particularly showed the familiar picture of superficial transversal rhagades between streaks of exfoliated epidermis. To give a full account of the aspect presented, I might simply copy the description of that terrible disease from any good treatise. There were occasional spells of apparent improvement followed by set backs, and at all times one could observe that peculiar phenomenon described by Nikolsky, namely, the easy detachment of the seemingly sound-looking epidermis on the slightest friction of the skin. Beyond a slight conjunctivitis and some irritation of the nostrils, the mucous membranes remained intact, which seemed to me an encouraging feature. There was usually some elevation of temperature, disturbed sleep and, as a matter of course, con-

siderable general discomfort. But no vital organ seemed to suffer. After the persistence of the severe symptoms for a period of one and one-half years there gradually commenced a slight improvement, the skin in some places remained firm, the face cleared up, and fewer and fewer superficial bullæ were formed. About three and a half years after the onset of the disease, during the past winter, the patient was able to visit me for the first time at my office. I have recently learned from the patient's sister that she is very comfortable, going to theaters and enjoying life, and evidently not much in need of further services by me.

My treatment of the case was, of course, varied. Internally I commenced with arsenic in small and frequently repeated and gradually increasing and then again decreasing doses. This was kept up for many months. Several such courses were carried out. Quinin was given at some times systematically, but did not seem to do so well. General tonics containing iron and strychnia, also cod liver oil with phosphorus, were given for long periods. The diet was arranged on most liberal grounds. Nothing which the patient really cared for was ever forbidden; even wine was allowed, and, in fact, the patient insisted on rather liberal quantities of claret and rum to insure sleep. Locally, protracted baths were given for a long time until the patient seemed to tire of them. Soothing lotions and mild salves were given in many varieties, according to the indications furnished by the condition of the skin. Of local applications the greatest benefit seemed to be derived from painting at first small territories and then the whole affected surface with a 10 per cent. solution of ichthyol.

How long the present favorable condition in this case may last remains to be seen. But in view of the sad, practically fatal prognosis of all these cases, I am glad to be able to report this somewhat unusual good result.

DISCUSSION.

Dr. W. T. Corlett, Cleveland, O., said that one or two distinct affections are grouped under the name of pemphigus. We all recognize pemphigus vulgaris, with its classic features, and we also recognize the peculiar form of dermatitis in the newborn, which clinically presents few if any of the features of pemphigus vulgaris. In these cases there is an exudation accompanying the pemphigus, with resulting excoriations, until usually the disease is relieved by death. There is a similar form to this met with in the adult. At the last meeting of the American Dermatological Association Dr. Corlett said that

he showed an adult with a bullous eruption which, for want of a better name, he called pemphigus foliaceus, although the case did not present the classical features pertaining to that disease, the lesions resembling more closely the type of pemphigus of the new-born. Most of these cases are fatal. The case he showed in Cleveland subsequently recovered, however. He has under his observation a physician whose brother died of this form of pemphigus about four years ago. This physician has been running down in health during the past year, and has suffered from bullous lesions on the face and hands. This type of the disease is not yet well understood. Dr. Corlett believes it is due to local causes, and that it occurs largely in debilitated subjects In regard to the occupation of butcher being an etiologic factor, Dr. Corlett said that he has seen the form of pemphigus described by Dr. Zeisler, although he has never associated it with the handling of meat.

Dr. John A. Fordyce, New York City, said that the neurotic theory has never appealed to him very strongly; about the only basis for it is the bullous eruptions in certain forms of leprosy and in other affections of the central nervous system. Dr. Fordyce favored the septic theory. The type of pemphigus which is seen in the new-born, pemphigus neonatorum, has been fairly well proved to be of streptococcic origin, and closely allied to impetigo contagiosa. He has seen pemphigus of a fatal type following injury; such cases are probably of septic origin. The microbic theory, however, will not explain all types, and those may possibly have their origin in some chemical agent.

Jay F. Schamberg, Philadelphia, said that it seemed to him that the so-called neurotic and infectious theories of the origin of pemphigus and pemphigoid eruptions may be harmonized. There is an abundance of clinical evidence to show that bullous eruptions may be produced by the introduction of animal poisons, by microbic infection, by drugs, and allied agencies. In these conditions there is circulating in the fluids of the body a chemical poison; in the last analysis the several poisons, although from diverse sources, are, perhaps, very closely allied, and produce the same pathologic results. In the bullous eruptions which have been observed from time to time to follow vaccination, the poison may have been introduced in the virus or through the vaccination wound subsequent to vaccination. At any rate there is strong evidence to demonstrate that these acute bullous eruptions are the result of an infection of one character or another; to say acute is to step on rather thin ice, for many of these cases last for months or years.

In the old classic form of pemphigus of long duration and fatal termination, it would appear that we have to deal with an autotoxic poison resulting from the mal-function of one organ or another, and exerting a selective action on nerve cells. Acute anterior poliomyelitis is an infectious disease, the poison of which possesses an affinity for certain cells in the spinal

cord; so the poison of pemphigus may possess a similar affinity for certain nerve structures. In many of the bullous eruptions following vaccination, arsenic seems to act as a specific. Dr. Schamberg recently had to deal with an extensive case of this character, and the giving and withholding of arsenic were coincident with improvements and recurrences in the disease. The disease was finally cured, the arsenic acting as much as a specific as does mercury in syphilis.

Dr. J. B. Kessler, Iowa City, Ia., reported that he has had three cases within the past eighteen months. Before that he has not seen a case for five years.

In reference to Dr. Zeisler's statement that avocation probably has something to do with the development of this disease, I might say that the first and second cases were in farmers, aged 46 and 50, who had suffered from the disease for a year and for four years, the lesions in Case 1 being confined largely to the trunk. The third case was in a girl of 16 who was employed in a hotel. At his first examination of this girl he was very much inclined to make a diagnosis of erythema bullosum, but when the patient came back in the course of a month, it seemed clearly pemphigus. Large bullæ came out of the sound skin, one in particular being as large as a hen's egg. Salicin, beginning with 15 grains, t.i.d., and increasing to 30 grains, seemed to do very well. In the two older patients he gave arsenic, salicin, and pretty nearly everything else, without any appreciable benefit.

Dr. L. Duncan Bulkley, New York City, reported a most troublesome experience with pemphigus. At the New York Skin and Cancer Hospital there have been one or more cases almost continuously, and even the nurses rebel against receiving them. A butcher had an acute, tense bullous eruption on his hands and said that for many years he had been subject to a recurrent attack at about the same season of the year. The bullæ were usually located on the hands and arms; sometimes elsewhere. They would last for a couple of weeks, and give him much distress. Dr. Bulkley did not think that the man's occupation might have a bearing on the trouble, but he put the patient on an absolutely strict vegetable diet, and gave him nothing but rice, bread and butter three times a day, together with some internal medication. Three days later the acute bullæ had flattened down, and within a week everything had disappeared and he passed from Dr. Bulkley's observation. That is the only instance he can recall in which the handling of meat or possibly meat and nitrogenous diet might have had some bearing on the origin of the disease.

Pemphigus should be distinguished from so-called erythema bullosum. Dr. Bulkley sees many of the latter cases, with a considerable amount of erythema, burning, itching and roughening of the skin; these cases are relatively mild, and yield to treatment, but in true pemphigus, in which bullæ develop on an uninflamed base, often in elderly persons, one is dealing with

a rebellious disease, and one that is responsible for most of the deaths in the skin department with which Dr. Bulkley is connected.

He considers arsenic a valuable remedy in this affection, and believes that physicians do not, as a rule, give it often enough or strong enough. If necessary, it should be repeated every two or three hours, six or eight times daily, in the form of Fowler's solution, and pushed until there is gastric or intestinal disturbance. Whatever may be the origin of these cases, he is absolutely convinced that these bullæ are the ultimate result of nerve disturbance, which theory he believes is largely confirmed by the control that arsenic has over these lesions.

Dr. A. Ravogli, Cincinnati, said that in order to establish the differential diagnosis between dermatitis herpetiformis and pemphigus one must bear in mind the polymorphic and relapsing character of the lesions and the presence of eosinophiles in dermatitis herpetiformis. Dr. Ravogli has under observation in the City Hospital, two girls, one 5 and the other 7 years old, with dermatitis herpetiformis, and in both of these cases the bullæ contain from 23 to 27 per cent. of eosinophiles. In true pemphigus he has found no more than 2 or 3 per cent. of eosinophiles. In dermatitis herpetiformis he has never found any alterations in the urine, while in every case of true pemphigus the urine has been found to be alkaline in reaction, and to contain albumin and casts, ano he has no doubt that this is an important factor in the differential diagnosis between the two diseases. It is possible that the leucocytes themselves, after losing their vitality, may act as a poison circulating in the system and produce intoxication.

He agrees with Dr. Schamberg regarding the utility of Fowler's solution in true pemphigus, but he has found that, in dermatitis herpetiformis, arsenic is absolutely useless. True pemphigus, in spite of all manner of treatment, is almost invariably fatal, while his cases of dermatitis herpetiformis have recovered under the use of iron and tonics, together with applications of ichthyol, which he has found extremely beneficial.

Dr. Joseph Zeisler, Chicago, said that the purpose of the paper was to call attention to an etiologic element which in previous years had not been clear to him. In 1892 he wrote the article on pemphigus for Morrow's "System of Skin Diseases," and at that time he did not have the impression that an animal poison had anything to do with pemphigus. Since then, observations of that kind have amplified and the cases he reported impressed themselves very strongly on his mind. The pemphigus problem has not been solved by microscopic examination, or by urinalysis, or by chemical examination of the contents of the bullæ. He hoped that in the near future physiologic chemistry will be developed to such a degree that physicians will be able to discover the presence of ptomains and leucomains, which it is not possible to do to-day.

OPSONIC THERAPY IN SKIN DISEASES.

H. R. VARNEY, M.D.
DETROIT.

It is now a universal belief that a number of diseases owe their origin to the invasion of the body by specific micro-organisms, and the true etiology of a class of affections of the skin is based on this belief. Hence the most successful treatment has been the application of that which would kill the invading microbe—without injuring the skin structure. The skin is constantly being invaded by micro-organisms which produce disease when the patients are physically below normal, and, to combat these infections more successfully, constitutional treatment has been found necessary.

All this was realized, but until Leischman, in 1902, gave to the profession his method of measuring phagocytic activity the progress of the treatment could be noted clinically only. Sir A. E. Wright and his associates, Leischman and Douglas, demonstrated by a series of experiments, based on the theory of phagocytosis, that there are properties in the blood serum which he calls "opsonins." The substances act by chemically uniting with the invading bacteria and so change them that the leucocytes are able to phagocyte the bacteria. These substances do not in any way affect the leucocytes. They are supposed to be specific for each micro-organism, though much remains to be known concerning them. When an infection occurs the relative resistance or the relative opsonic power of the blood is lower than normal.

Although the reports to date have been confusing and unattractive, the fact that we, as clinicians, regard of

value is that we are given not only a relative means of determining the resisting power of the patient toward an invading microbe, but also a method of raising his resistance by bacterial vaccinations.

More than four years have elapsed since Wright modestly made known his theory and practical results with bacterial vaccinations. Wright has classified diseases due to bacterial infection into three groups; the first only being of special interest to us, as dermatologists, is as follows:

Diseases in which the bacterial process is strictly localized or shut off from the lymph and blood circulation, as acne, furunculosis, sycosis and lupus. In this class the opsonic index is persistently low, owing to the absence of immunizing stimuli.

This lowered resistance may be more or less localized, due to an abnormal condition in the skin structure and its functions, or there may be a general lowered resistance toward a given micro-organism. It is with this class of disease that bacterial vaccinations offer most in permanency of cure. In those due to abnormal conditions, unless these conditions are corrected by accompanying treatment, recurrence takes place.

The localized microbic diseases of the skin furnish the most satisfactory class for the application of this treatment, as the diseased condition may be so accurately observed and the invading micro-organism easily located and there is absolutely no danger to be experienced from inoculations of vaccine made from these bacteria.

It is my intention to present the results of my personal experience in the therapeutic application of bacterial vaccinations, controlled with and without opsonic readings, in a class of chronic, rebellious, localized infections of the skin, due to the staphylococcus pyogenes, including acne-vulgaris, sycosis and multiple furunculosis, and I would hesitate to report them at this time

were they not similar to those of earlier investigators along this line.

The principles of this treatment can more readily be understood by referring to charts of selected cases from each group of disease mentioned. They have been care-

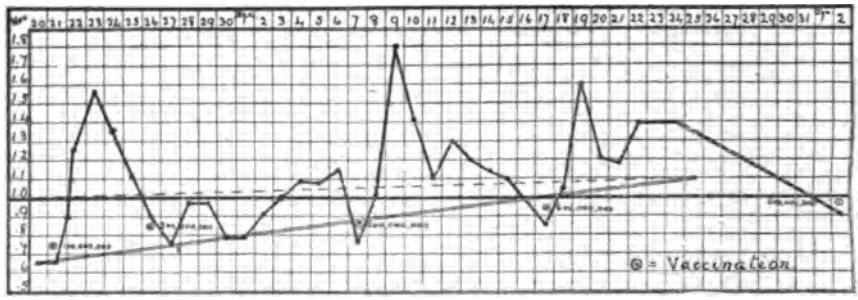

Chart 1.—Acne vulgaris: Solid line, opsonic index; broken line, increase above normal double line, improvement curve.

fully observed during the treatment according to prescribed methods. The technic used is that prescribed by Wright and his followers, with a few slight modifications.

1. A pure culture, the causative micro-organism, or, if a mixed infection, the micro-organisms, was isolated.

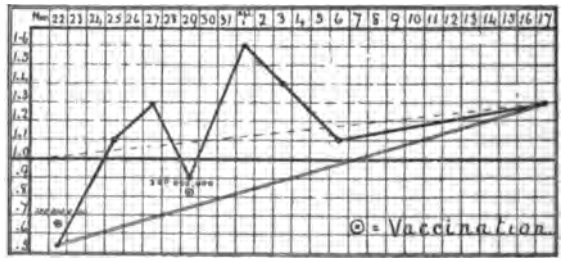

Chart 2.—Furunculosis: Solid line, opsonic index; broken line, increase above normal; double line, improvement curve.

2. Estimate was made of the opsonic power of the patient's blood to this micro-organism before any vaccination was given. 3. A vaccine was prepared and standardized from the micro-organism. 4. The patient was

inoculated with this vaccine, with varying doses at indicated intervals, determined only by systematic estimations of the opsonic contents of the patient's blood. The special technic for measuring the resisting power of the patient, or to discover the opsonic index, is familiar to all and will warrant omission here.

This method of obtaining the opsonic index, that is, estimating the amount of opsonins in the blood, is, as yet, very inaccurate, and can be obtained only relatively, as phagocytic action may be easily influenced in so many different ways. Therefore, to attain to any degree of accuracy during a series of readings, each step of the

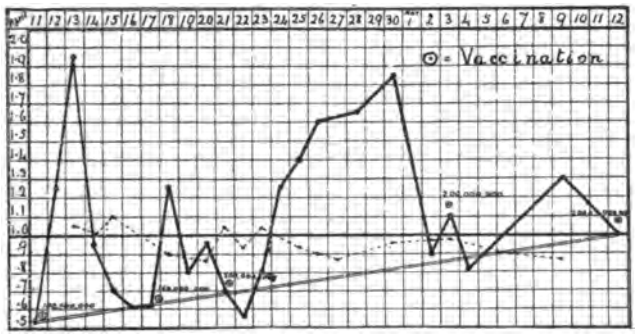

Chart 8.—Sycosis (coccogenic): Solid line, opsonic index; double line, improvement curve.

technic should be taken each day, at the same hour of the day and under as nearly as possible the same existing conditions.

While Wright's method of estimating the resisting power of the blood is a decided advance in medical science and the only fairly accurate means as yet, it is open to many objections, though of unquestionable value as a guide in the therapeutic application of bacterial vaccinations.

PERSONAL CLINICAL EXPERIENCE.

In reporting the results of the therapeutic application of this treatment in a series of about forty cases, twenty-

seven of which were dermatologic, I feel that time will permit only a summary of the interesting features of each group of diseases. At present this new theory is limited almost wholly, in results thus far reported, to chronic, localized infections, and even in these conditions its field of usefulness can be widened by combining it with other methods.

ACNE.

This group included rebellious, long-standing cases, and, in justice to Wright's methods and principles, no other treatment was used, so that a fair test was given them. These patients came daily to the laboratory and their opsonic indices were determined, the average of three readings being taken. These were the results of comparing the patient's blood each time with a normal pool made up of several healthy persons' bloods.

Autogenous vaccinations were then given, the vaccines being carefully prepared and standardized. Experience convinces me that in some of my early cases too large doses were administered. The dose to be selected is one that will cause no constitutional disturbance, only a short negative phase and a prolonged positive phase. The first dose always should be small, because the opsonic rise is often greater after this vaccination than after the second or third. If too large a dose is administered this pronounced rise in resistance will be shortened, and this also shortens the duration of improvement clinically.

With increased opsonic power, which is increased phagocytosis, clinical improvement begins and continues as long as the patient's index stays near or above the normal blood. Whenever the patient's index drops within a point or two of its original mark fresh outbreaks of the disease appear, clinical improvement going hand in hand with opsonic rises. In the treatment of acne it has never been my privilege with other forms of treatment to see or to obtain such rapid improvement

Fig. 1.—Acne vulgaris; before vaccination.

as that following the first forty-eight hours after the first vaccination in selected cases. This improvement continues from five to seven days; at that time the patient's index will have dropped down to near its original mark. Generally, with careful readings, we are able to determine when to vaccinate again before a fresh outbreak occurs; or before the index is allowed to drop too low; the object being to increase gradually the patient's resistance and fortify the preceding vaccination by revaccinating.

In an attempt to shorten the technic, seven cases, after indices were determined, were vaccinated with stock vaccine or that made from acne cases similar in type. The positive phases were as pronounced and clinical improvement as encouraging after the first vaccination as in those who were given autogenous vaccinations; yet after a series of from three to five properly-spaced vaccinations the improvement, though great, seemed to remain at a standstill after the third vaccination, and there was not a permanent cure of one of the group.

In a series of five cases autogenous bacterial vaccinations were administered, vaccinations being given when clinical observations showed new lesions, the first three vaccinations being given about one week apart. Four of these cases have been discharged cured, demonstrating that autogenous vaccinations are productive of better results than those from stock vaccines. The only short route, therefore, in the technic is in omitting the opsonic estimations.

Out of a group of twenty-one cases, nine of the most extensive, long-standing cases were given autogenous vaccinations, revaccinations being governed by the patient's opsonic indices. Six have been discharged, cured by this method alone; one discontinued treatment, and with two patients it was necessary to combine other treatment with bacterial vaccinations to obtain a cure.

FURUNCULOSIS.

This group included five cases of multiple furunculosis, three of which were of months' standing. One patient, female, presented fourteen active furuncles on the arms, wrists and hands. These followed an attack of la grippe, which was accompanied by an abscess of the frontal sinus. After two autogenous vaccinations the patient made a complete recovery, no new lesions developing after the first vaccination and the old lesions disappeared rapidly. Another case of multiple furunculosis followed a series of four abscesses about the rectum, with no apparent cause other than lowered resistance. No furuncles or abscesses have appeared since autogenous vaccinations were given.

The third case was that of a man who had had multiple furunculosis of the hands, and also chronic, papular eczema which had existed two years continuously in spite of careful treatment. After three autogenous vaccinations there were no new furuncles, and the eczema has since subsided.

The other two cases in this group responded in equally as gratifying a manner, and there has been no recurrence of the disease after several months, when the patients were discharged. No other treatment whatever was given. In this most troublesome condition to both patient and physician no uniform treatment has been successful. The spontaneous disappearance of furuncles, occurring long after the patient's faith in drugs has been exhausted, may be explained by the fact that Nature prepares by a sudden setting free into the circulation certain bacterial toxins which act as a vaccination, thereby increasing the opsonic resistance of the patient, and recovery results. The mechanical means in bringing this condition about, such as the poultice of an old lady, Bier's passive hyperemia, and the Roentgen ray and Finsen light, all assist in auto-inoculating the

Fig. 2.—Acne vulgaris; after vaccination.

circulation with bacterial products, thereby raising the resistance, by increasing the opsonins, when recovery takes place.

SYCOSIS.

In two cases of coccogenous sycosis, that had existed two and six years respectively, the patients were given autogenous vaccinations controlled by opsonic indices. After a series of vaccinations covering a period of ten weeks the first patient became disheartened and discontinued treatment, the disease being only slightly improved. This patient presented a history of multiple abscesses, which necessitated hospital treatment for five months. His resistance to the invading germ was unusually low, so that the opsonic rises were only slight. He was among the first on whom the treatment was administered, and greater experience has taught me that the first doses were larger than those which have since been used with better results. On the administration of 600,000,000 germs the patient's negative phase was most marked and he suffered constitutional disturbances —headache, langor and general malaise. I, therefore, feel that this failure was probably due to too large a dose at the onset.

The other patient presented a condition that had been rebellious to all forms of treatment for a period of six years. After a series of five autogenous vaccinations the disease entirely disappeared and the patient was discharged. Following the first dose there was a cessation of fresh outbreaks, and no further activity of the disease was again apparent until the index reached its original point. During the treatment of this patient there was an illustration of the effect of loss of sleep and alcoholic stimulant. This effect was a decided and prolonged drop of the patient's index or resistance.

This same influence on the resistance was shown under similar circumstances in patients who were so

treated for acne. Excessive fatigue and menstruation, also lower the index. It is, therefore, most important that patients while receiving this treatment be warned against those things which are decided handicaps to the treatment. The physician should know the physical condition of each patient before he administers a bacterial vaccination so that no vaccination will be given when the resistance is abnormally low.

CONCLUSIONS.

I am convinced that in bacterial inoculations we possess a therapeutic agent with a specificity of great merit. Wright's method of obtaining the resisting power of a patient is also of unquestionable value as a guide to determine what will raise the resistance. Vaccines made from the patient's own invading micro-organisms (or autogenous vaccinations) produce better results than those made of stock vaccines. These results can be obtained with or without opsonic readings, but they will be uniformly better if the vaccinations are controlled by frequent estimation of the patient's resistance.

I believe that proper autogenous vaccination, administered in appropriate doses, when the patient's index indicates the necessity for revaccination, is a harmless, quick and efficient treatment in certain chronic localized infections yet to be classified.

DISCUSSION.

DR. JAY F. SCHAMBERG, Philadelphia, thought that opsonotherapy ought to be of value in a small number of cutaneous diseases, characterized by circumscribed infectious foci in the skin. He has treated seven or eight cases by this method, most of them sycosis or acne. In a case of long standing, rebellious sycosis, there was a striking improvement from the date of the very first injection, the pustules drying up and disappearing. Two injections were given and a cure effected. In other cases there has been an improvement, although in some of them relapses have occurred. One very severe case of indurated pustular acne has improved somewhat under this treatment, but the improvement has not yet been striking. Despite the successful results obtained by Dr. Varney and others, Dr. Schamberg thought it questionable whether acne

in most cases will be amenable to this treatment. The staphylococcus is certainly not the cause of acne. If acne is to be treated by increasing the defensive power of the system and weakening the invading organism, that organism must be used which is really the cause of the disease. Staphylococcic injections in acne may, however, lessen or prevent secondary pustulation. Dr. Schamberg has treated one patient with a papular vesicular eczema, complicated by the subsequent development of pustules and a few furuncles. One injection seemed to effect a cessation of the pyogenic complications and was followed by a distinct improvement in the eczema. Much has been said concerning the actual value of the opsonic index. At present there is great unreliability in the determination of these indices and it is to be hoped that it will in the future be unnecessary to employ them, thus simplifying the technic. He believes the use of the word vaccine to designate bacterial emulsions should be strongly deprecated. Apart from the fact that it is etymologically impossible, the word being derived from "vacca," a cow, it is unnecessary and confusing.

Dr. R. A. McConnell, New Haven, Conn., thought it incredible that acne can be benefited by the opsonic therapy without reference to the probable cause of the disease. He has never seen a case of chronic acne cured without a proper regulation of the patient's diet, and he has never seen a case that was not materially helped by proper regulation of the diet. The injection of anything which will raise the patient's opsonic index seems to be with a hope which is not justified.

Dr. L. Heidingsfeld, Cincinnati, stated that the subject of opsonins as yet presents many technical difficulties which seriously preclude its practical application in general practice. Yet he is convinced that a great deal of useful and practical knowledge will be derived from the studies and investigations which have been achieved in the past and will be carried on in the future. The greatest obstacle thus far encountered is the technical difficulty in determining the indices, and if this feature can be eliminated, or materially modified, it will mark a great advance in the serum and antitoxic therapy of the future. The good which will come from these investigations can well be illustrated by the fact that the opsonic studies have demonstrated that the opsonins must not be injected on a rising index; that the index must first be allowed to rise to its highest point, and reach a period of decline before further inoculations are made, otherwise they are apt to precipitate a falling index, which will continue to fall farther and more rapidly, the more frequently the inoculations are made. This fact was forcibly brought home to him in connection with some ten or twelve cases of lupus, which he was treating some two or three years ago with tuberculin after the method of McCall Anderson. He obtained marked improvement in all the cases for a short time. After four or five injections of tuberculin were given, some of the patients failed to show any

improvement and steadily became worse. This continued until fewer and fewer patients responded favorably to the treatment, and he was obliged to withdraw the treatment before a satisfactory result was obtained in a single case. The opsonic investigations led him to believe that he had been injecting the tuberculin too frequently on a rising index, and about six months ago he again reverted to the tuberculin treatment in a number of the same and additional cases, and obtained a marked and satisfactory improvement in every case thus treated by giving a smaller amount of tuberculin and at less frequent intervals. He believes that the further study of opsonins will give a clearer insight into the serum treatment in all forms of infectious diseases, and that it will be of material aid in the evolution of this important field of therapy of the future. He has also achieved excellent results in a few cases of lupus of the skin and tuberculosis of the genito-urinary tract with the new anti-tuberculous serum of Marmorek, and strongly urged its tentative application in this class of affections.

Dr. Joseph Zeisler, Chicago, stated that, as long as the technic of the opsonic treatment is as complicated as it is now, laboratory aid is absolutely essential, and this, to a great extent, will prevent the measure from becoming popular for the general practitioner. He hopes that the large laboratories, with the necessary equipment and facilities, will try to give, as soon as possible, stock toxins for injection which can be used in a routine way. If it is necessary each time to determine the opsonic index, the method will remain impractical and beyond the reach of the ordinary physician.

Dr. W. H. Mook, St. Louis, thought the time not far distant when it will be possible to demonstrate that diet has absolutely no influence on the treatment of acne vulgaris, which Engman and he consider to be local. The acne bacillus of Unna-Engman has been demonstrated in a number of cases, and it is along this line that a cure for acne vulgaris will be found. In the St. Louis Skin and Cancer Hospital they are getting cultures of acne bacilli and are working along this line in connection with the opsonic index, and he believes that curative results will only be obtained with vaccines made from cultures of acne bacilli.

Dr. M. B. Hartzell, Philadelphia, said that the most we can say, from the evidence at hand regarding opsonic therapy, is that it is encouraging; the number of cases reported as actually cured is very small as yet. The present method of obtaining the opsonic index is clumsy and unreliable, and stands in the way of a more general adoption of the method. Furthermore, the rise is followed shortly by a corresponding fall, so that the injection must be repeated. Does this mean that the treatment must be kept up indefinitely? Do the injections raise the patient's powers of resistance only temporarily—not permanently?

DR. H. R. VARNEY, Detroit, in reply to Dr. Schamberg's query as to the true etiology of acne, said that, although it is still a disputed subject whether the lesions are due to the pyogenous micro-organisms or to the acne bacillus, his investigations thus far have indicated that, whenever bacilli are present, autogenous vaccines made from a mixed culture are productive of better results than vaccines made from the predominating micro-organism. It is, therefore, most important, before preparing the vaccine, to obtain cultures from several lesions, so as to determine not only the predominating micro-organism, but also what micro-organisms exist. Then a mixed vaccine should be made.

The importance of diet in the treatment of acne is recognized by all. In many of his cases of acne the localized infection was without doubt secondary to other existing conditions, both general and local, and unless these conditions are corrected, recurrence is likely, even though an apparent cure has been brought about by vaccinations. In treating acne, the patient should be made to understand that whenever there is the first evidence of a fresh outbreak of the lesions he should return for a revaccination. In this series of cases reported by Varney, about every seven days the index had apparently dropped, and revaccinations were given. In spacing the first three vaccinations, without opsonic readings, once a week is an average interval; after which revaccinate whenever there are clinical evidences for its necessity. Revaccinations are always given during the negative phase, but it should never be allowed to drop below its original condition. If such a condition occurs, it would be best to wait and allow the patient's index to rise before revaccinating. For the first twenty-four hours after revaccination, a slight negative phase always follows, and if the patient's index is allowed to drop too low before revaccinating, a fresh outbreak occurs. In administering Koch's T. R. we have all realized the deleterious effects of too large doses, and in Dr. Heidingsfeld's cases this was no doubt the reason for the cessation in improvement. Rather than increasing the opsonins in the blood, they were probably exhausted by over-doses, and an increased toxic condition was produced. Much also depends on the general condition of the patient at the time the vaccination is given. It is far better to wait until after menstruation than to vaccinate twenty-four or forty-eight hours before. As to continuing the revaccinations indefinitely, as referred to by Dr. Hartzell, he would say that if the case is one in which bacterial vaccinations will be of value, and the proper vaccinations have been given, the patient will not only be cured, but will be more or less immunized against the invading micro-organism of that particular disease, even though his index gradually falls.

ONYCHOMYCOSIS TRICHOPHYTINA,

WITH REPORT OF TWO CASES.

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CINCINNATI.

The nails, like any other epidermic tissue, are exposed to the invasion of the trichophyton, yet cases of the kind occur rather rarely. Saubouraud, in the department of the ringworm affections in the Hospital St. Louis, considers onychomycosis trichophytina a rare disease. Neuberger[1] referred to the fact that Anderson, in Glasgow, among 11,000 cases of cutaneous diseases, of which 178 were of trichophytic nature, did not have a single case of trichophyties of the nails. White, of Boston, in 5,000 cases of diseases of the skin, with 180 cases of tinea trichophytina, did not have one case of trichophytic onychomycosis. On the other hand, Pellizzari, Arnozan, Dubruille have often seen cases of the kind, and Pick considers this affection of the nails not so rare as stated by the others.

In some cases of onychomycosis trichophytina, the origin of the fungus is clearly found as patches of herpes tonsurans in other parts of the body, showing the infection of the nail to be due to the act of scratching. Mahon noted the coincidence of herpes tonsurans of the scalp, with that of the finger-nails, which are in this way more frequently affected than the toe nails.

In rarer cases the nails only are infected with trichophyton, and yet the patient has never had any trichophytic affection in other parts of the body. A case of

1. Ein Fall von Onychomycosis Trichophytina, Derm. Ztschr., xi, 551.

Fig. 1.—Hands of patient in Case 1, showing destruction of nails.

this kind was reported by Gerson,[2] where a man had the nail of the second finger of the left hand for two years affected with trichophyties, and gradually all the other finger-nails were equally infected, without showing any patch of trichophyties in any part of the body. The case of Neuberger[1] is of the same kind and shows that onychomycosis trichophytina can be found without there being other places of infection on the body, and that this condition exists a long time.

The assertion of Zinssers,[3] that tinea tonsurans of the nails never occurs unless preceded by attacks of the same in other parts of the body, falls to the ground.

ETIOLOGY.

It is easy to understand that any one who is affected with trichophyties of the body, and more especially of the beard and of the scalp, by scratching with his finger-nails, gets the spores of the fungus underneath the nails, and so the nails are infected.

To this class of cases is to be referred the case of Bosc and Galavielle[4] in a man who was suffering with an extended attack of trichophytosis of the body, and consequently showed alterations of the finger-nails, which microscopically and through culture revealed the presence of the fungus.

The presence of the trichophyton in the nails without any previous attack of trichophyties in other parts of the body gave to Hirtz and Jacquet[5] the idea that in these cases the fungus does not produce the disease primarily, but only secondarily, as a consequence of trophic disturbances of the nail. They reported two cases of trophic alterations of the nails, which showed great

2. Berlin. Dermat. Gesellsch., January, 1899; ref. Archiv f. Derm. und Syph., xlviii, 136.

3. Encyklopedie der Haut und Geschlechtkrankheiten, 1900, p. 225.

4. Onychomycose trichophytique, Arch. f. Derm. und Syph., xli, 419.

5. Hysterotoxia, Onychomycose trichophytique, Arch. f. Derm und Syph., li, 447.

similarity, and in one they found the presence of trichophyton, while in the other it was absent.

I thoroughly agree with Krzystalowicz,[6] who maintains that, in order to establish the diagnosis of onychomycosis trichophytina, there must be found the fungus under the microscope.

Recently in my practice I have had two cases of onychomycosis, which are interesting to consider, one after the other, on account of their different clinical and pathologic features.

CASE 1.—*History.*—A man of 54, of splendid physique, married, had always enjoyed good health. In himself and his family no history nor trace of syphilis, psoriasis nor eczema could be found. He had been suffering for over twenty-years with his finger-nails and toe-nails, which did not cause him pain, but only discomfort. He was by occupation a flour merchant, and when he began to notice his finger-nails rough and diseased, he was under the impression that it was produced by an insect called "weaver," which is found in the flour. The first finger-nail to be affected was that of the second finger of the left hand. At the time I saw him it had completely disappeared and was replaced by a thin, atrophic and somewhat irregular scar. Some time later the nail of the third finger of the same hand was affected and there remains (Fig. 1) only a thin atrophic peeling. Gradually every nail showed signs of disease by losing its brilliancy, getting chalky, scaly and irregular. The nails were easily broken, causing inconvenience in the use of the hands. Some time afterward several toe-nails were equally affected. In all these years the patient never had any reproduction of trichophyties in any other part of the body. He had in the meantime consulted several physicians and many remedies had been given. The only benefit the patient had ever obtained was from bathing the fingers in a solution of bichlorid of mercury.

Examination.—A few months ago the man called on me to see if something could be done. On the first examination, the long standing of the affection, the absence of any ringworm attack in any part of the body, were against the possibility of trichophyton infection. Every nail of the fingers and toes was affected in a different degree according to the time of its infection, so much so that while in the second and third fingers of

6. Die Pathogenen Haarpilze, Poln. Zeitsch. f. Derm. und Ven. ref. Monh. f. Pract. Derm, xiii, 428.

Fig. 2.—Photomicrograph of nail-plate of patient in Case 1, showing fungus penetrating between the interstices of nail-plate. Bausch and Lomb 1/6 in. objective.

Fig. 3.—Scalp of patient in Case 2, showing large trichophytic patches.

the left hand the nails had been entirely lost, in the other fingers they were affected in different degrees. The nails were somewhat thick, opaque; their surface rough, uneven and showing longitudinal folds. The nails kept on breaking and splitting in longitudinal direction, and pieces of nail were hanging on the nail-bed. Where the nail had fallen or had been removed, as on the thumb of the left hand, an ugly irregular surface of the nail-bed remained, looking as if riddled by small holes. In order to establish the diagnosis a piece of nail was taken from the thumb of the left hand, it was softened in a solution of potash and then examined under the microscope. The fibers of the nail-plate contained spores and mycelia of trichophyton, which were arranged in rows between the edges of the epidermic cells forming the structure of the plate of the nail. Another piece of nail was washed in alcohol, crushed and was dropped into a culture medium of maltose-agar. After eleven days, around the piece of nail there appeared a light whitish area, which gradually extended by peripheral progress until it had invaded the whole surface of the culture. Some of the vegetation of the fungus was examined under the microscope, it proved to be a clear specimen of the ordinary trichophyton. The diagnosis was confirmed as that of onychomycosis trichophytina.

It was difficult, however, to conceive how it was possible that nails could get infected without any other point of the body ever having shown trichophyties, and that the toe-nails could also be infected without producing ringworm infection in other parts of the body. The explanation has to be found in the anatomic structure of the nail-plate and in the way that the fungus vegetates therein.

The photomicrograph (Fig. 2) shows the fungus penetrating between the interstices of the nail-plate, and the nail fibers separated just as we see it occur in the hair. In order that the vegetating fungus may be introduced in the interstices of the nail fibers, there is necessary a trauma of the nail. This patient used to trim with thin scissors the affected nails and then with the same scissors the other nails. It is clear that with the scissors he carried spores of trichophyton from one nail and inoculated them deeply into the structure of the other nails.

The fungus vegetating inside of the fibers of the nail is protected and can not easily be transported to other parts. This satisfactorily explains how the trichophyton could remain for so many years in the nails without being conveyed to other parts of the skin.

It will now be of some interest to make a brief comparative study of the other case of onychomycosis, where the scalp had been affected with tinea trichophytina.

CASE 2.—*History.*—In this case a few weeks after the patient had the affection of the scalp three finger-nails of the right hand became badly infected. The nails were of those three fingers which he used in scratching his head to relieve the itching. The occipital region of the scalp was covered with large irregular trichophytic patches (Fig. 3), evidently the result of several round spots coalescing. The spots were partially bald, studded with stumps of hair, covered with thin, dirty, adherent scales, showing the clearest features of the trichophyties of the scalp. The nails were inoculated a short time afterwards and Figure 4 shows that the appearance of the affection consisted in a more acute process, and the injury produced in the nails was much more perceptible. Indeed the nails were entirely of a dirty yellow hue, chalky, thin and atrophic towards the matrix, and thickened and irregular towards the free edge of the nail-plate. The surface showed holes and crevices in the nail substance and large pieces of the nail were breaking and detaching themselves in a transverse direction. This is easily explained when we remember that in this case the fungus had not been brought to the internal structure of the nail-plate, but it had been placed on the surface of the nail in its eponychium, hyponychium and in the subungual epidermic layer. Consequently the fungus had to work its way through, so as to reach the laminar structure of the nail.

This is well proved by the microscopic examination and by the photomicrograph (Fig. 5) which was made by my assistant, Dr. George H. Werk.

The action of the fungus on the epidermic structure, according to Leslie Roberts, is that of digestive power on the horny tissues. It penetrates into them, making them its habitat. It detaches the epidermal cells one from another, and by digesting the hard membrane

Fig. 4.—Showing infection of nails in same patient as Fig. 3, due to scratching of scalp.

Fig. 5.—Photomicrograph showing spores and mycelia of trichophyton invading substance of nail.

appropriates their plasma as nutrition and consequently the epidermal cells die.

In the first case where the nail-plate had been primarily affected, the resulting alterations were somewhat different. The fungus with its spores and mycelia was disposed in long rows between the epidermic fibers composing the nail-plate, just in the same way as it is disposed in the cortical layer of the hair. Consequently the fibers composing the body of the nail were torn one from the other and the nail was breaking in a longitudinal way, according to the direction of the fibers. In the second case where the fungus from the eponychium had invaded the nail superficially, the nail had shown a tendency to break irregularly in large scales and more often transversely.

In order to ascertain whether the difference of the alterations could be produced by different kinds of trichophyton I resorted to the culture. Maltose-agar was used as a culture medium in the Erlenmeyer bottles. One culture medium was inoculated with a piece of nail of the patient in Case 1, and in the two others one was inoculated with scales of the scalp and the other with a piece of nail of the patient in Case 2. In all positive results were obtained. The culture medium inoculated with the epidermic scale of the scalp showed, four days after the inoculation, a whitish, dusty halo around it, which gradually began to spread peripherally. The nail culture of the second patient showed the same condition after six days, while the nail culture of the first patient did not show signs of any result until after eleven days. The result of the culture was the same in every one, consisting of an abundant whitish, purulent, thin growth of the fungus, trichophyton megalosporon endo-ectothrix, with large spores of the common kind often taken from domestic animals.

The cultures proved that the fungi were the same, but this did not furnish any explanation in reference

to the difference of the pathologic alterations. The only explanation I find is in the way of the introduction of the trichophyton into the nail structure. In the first case it was inoculated by the scissors in cutting and trimming the nails, and the spores were introduced into the interior structure of the nail-plate. In the second case the spores had been deposited in the eponychium and in the subungual layers, and consequently they had attacked the nail from the outside toward the inside of the nail-plate.

The distribution of the fungus in the superficial layers of the nails, or in the intimate structure of the nail-plate, is a sufficient reason for the difference of the course in the two cases. In the first case the disease lasted for over twenty years without giving a chance to the infectious spores to be transported into any other part of the body. The spores growing between the interstices of the fibers forming the nail-plate are protected, and it is not easy for them to be transferred to other parts except by cutting the nail. While in the second case where the parasite was vegetating on the eponychium and in the subungual folds of the finger, the nail was attacked from the external layers towards the internal. The distribution of the parasite explains how easily the spores of the trichophyton can be transferred from the nails to other parts of the body.

In my cases the ultimate result of the fungus on the nails has been that of causing complete atrophy. My experience is more in accordance with that of Kaposi,[7] who maintained that in the trichophytic affections the nail disappears by atrophic process. Censi,[8] however, referred to the possibility of the hypertrophy of the nail in form of onychogryphosis and made a variety of onychogryphosis trichophytina. I believe, however, that in those cases the alterations of the nails were not due

7. Die Patologie und Therapie der Hautkrankheiten, Vien.

8. L'onicogrifosi Tricofitica; Giorn. Ital. delle malattie veneree e della pelle, xxxiii, 5.

entirely to the parasite, but the distrophic conditions were due to other causes and the trichophyton was of later occurrence.

PROGNOSIS.

In cases in which the parasite is hidden in the interstices of the cells of the nail-plate, it can be reached only with great difficulty, and the obstinacy of the case, lasting for over twenty years, shows that the prognosis is bad. In the cases in which the fungus is on the surface of the nail-plate, however, it can be reached and the fungus can be destroyed, and with constant treatment we are rewarded by seeing the nail grow free from the disease.

TREATMENT.

In the case of the first patient it appears, from the condition of the nails, that anything which was used brought only a temporary relief, while in the case of the second patient with constant applications of Wilkinson's ointment the patient obtained perfect recovery within four months. This shows that in one case the spores were protected in the interstices of the cells forming the plate of the nail, and can be reached only with great difficulty. It is difficult, indeed, to bring a case of onychomycosis of the first type to recovery, so much so that in many cases it has been necessary to remove the nails. The affected finger is wrapped up in lint, well saturated with salve containing a large percentage of pyrogallic acid so as to produce an inflammatory condition of the nail, an artificial paronychia. In this way the nail is detached from the surrounding epidermis and it can be removed. This method is rather severe and not all patients are ready to submit to it. My patient, when the pyrogallic acid began to inflame the skin, stopped its application and discontinued treatment.

Pellizzari[9] reported one case of onychomycosis as cured by means of the Roentgen rays. He claimed that nine exposures of ten minutes each were sufficient to effect the recovery. It was my intention to apply the rays, but the patient did not come back.

The other patient was kept in the hospital and was put to work as an orderly in the ward. Good results were obtained from the application of unguentum Wilkinson to his scalp and fingers. I ordered his scalp and his fingers to be scrubbed with pure green soap once a day, and then rubbed and covered with the ointment. When he left the hospital the trichophytic patch of the scalp was perfectly healed, and the nails had all grown out new, showing no signs of alterations. The patient, so far, has not returned, which I consider a proof of permanent recovery.

DISCUSSION.

DR. J. B. KESSLER, Iowa City, said that six or seven years ago a farmer reported having barn itch. He had a fungoid eruption on the back of the hand, and its inflamed, elevated border contained pus. Accompanied by a veterinarian, Dr. Kessler visited this farmer's place and found about the noses and necks of the calves circles that looked like asbestos. These lesions were scraped close to the roots of the hair, where numbers of trichophyton fungi were found. Several calves and one horse were affected. Farmers thus infected are very apt to carry the infection to the barber shop. Dr. Kessler considers this the most common method of spreading the disease. It is a curious fact that, as soon as spring time comes and the farmer turns his calves out to pasture, they recover very rapidly from this affection, and when they are again confined to the pens during the cold weather they again contract the disease. Those who do not live in a farming district will probably find, on investigation, that trichophytosis is spread in the barber shops from human to human, and that this type of disease is comparatively easy to cure, but when a patient is thoroughly inoculated from a calf, the affection is much more virulent and more difficult to eradicate.

DR. M. L. HEIDINGSFELD, Cincinnati, said that he is firmly of the opinion that the infection of the trichophyton does not take place directly in the nail substance, but in the tissues from which the nail is originally formed. It is difficult to

9. Lo Sperimentale, 1906, lx, 6.

conceive how a hard, non-succulent substance like nail, after it has once been perfectly formed, can be a culture medium for any form of infection. Products like the nail and hair once removed from the body show no effect after inoculation with fresh, active cultures. The infection of the trichophyton occurs primarily in the nail-fold and extends thence to the matrix, which becomes inflamed and so pathologically changed that any nail substance which is subsequently formed is rough and irregular in outline, opaque in appearance and contains areas of cells corresponding to layers of imperfect keratinized cells, derived from the matrix. These round, imperfect keratinized cells are the round bodies which Dr. Ravogli has mistaken for spores. These conclusions were drawn by Dr. Heidingsfeld in a paper presented to this Section some seven or eight years ago. That nail substance when placed on culture media should grow fungus, possesses no significance inasmuch as contamination of this character occurs from almost any substance under similar conditions.

Dr. Granville MacGowan, Los Angeles, Cal., agreed with Dr. Heidingsfeld that the infection in these cases takes place in the nail-bed. It is an exceedingly disagreeable affection, particularly in women, whether they be servants or in the higher walks of society. Dr. MacGowan has seen a number of these cases during the past five or six years, and has been rather at a loss what to do for them in order to get a speedy recovery, until he happened to think of the old remedy common among farmers and known as "sheep dip," or Vleminckx's solution, which is practically a solution of calcium sulphid, in which they soak their hands at night. He has found this very efficacious as a temporary expedient, while for permanent relief he prescribes an ointment of the oleate of tin, which, together with the x-ray, proves most satisfactory.

Dr. M. L. Heidingsfeld, Cincinnati, expressed the opinion that the best results of treatment are obtained if attention is directed to the nail-fold and not to the nail itself. The remedy he has found most efficacious is a 1 per cent. solution of corrosive sublimate in ether and alcohol.

Dr. A. Ravogli, Cincinnati, said in regard to the non-inoculability of the nail to trichophytosis, that the presence of the trichophyton in the nail tissue has been successfully proved by inoculation on culture medium. The spores can not be so well shown in the microphotograph on account of the difficulty of staining them.

THE SALICYLATES IN THE TREATMENT OF LICHEN PLANUS.

SOME UNUSUAL FORMS OF THIS AFFECTION.

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Perhaps the most generally useful internal remedy in the treatment of lichen planus is arsenic, which, when associated with appropriate local applications, in most cases produces improvement within a reasonable time and eventually a cure. In a not inconsiderable minority, however, arsenic fails to exert a favorable influence on the disease, or may even aggravate it and materially increase the patient's discomfort. In these cases I have recently employed with more or less success the various salicylates, which, so far as I know, have not yet found a place in the text-books as approved remedies in this disease, although a closely related drug—salicin—has been recommended by Crocker. Although the number of cases in which I have used them is yet small, the relief afforded in some instances was so immediate and decided that I have thought it worth while to call attention to these remedies with the hope that they may receive a more extended trial.

CASE 1.—*Patient.*—Mr. S., aged 46, a hard-worked clerk in a large manufacturing establishment, came under observation early in October of last year, with a most extensive lichen planus.

History.—The eruption which was of one month's duration, was at first limited to the abdomen and forearms, but rapidly

spread until it involved every region but the face and was attended by severe itching.

Treatment.—At first arsenic was given in moderate doses, but the eruption continued to spread, and the itching was not at all relieved. After two weeks of ineffective treatment with arsenic he was given salicylate of soda, which was followed by immediate relief of the severe pruritus and a check in the spread of the eruption. At the end of another two weeks it was noted that new lesions had ceased to appear and that there was no longer any itching. After another week or two of the salicylate treatment it was stopped and the arsenic was again taken up; but the return to the arsenic was soon followed by a return of the itching and the appearance of new lesions. The resumption of the salicylates, sometimes salol, sometimes lithium salicylate or sodium salicylate, was followed by speedy improvement, which continued to complete recovery.

CASE 2.—*History.*—Mrs. L., aged 43, had a lichen of three or four months' duration, which, although moderate in extent, being limited to the wrists and legs, was intensely itchy, giving the patient rest neither night nor day, so that she was in an extremely nervous and overwrought condition. The skin, too, was unusually sensitive, every local application seeming to increase the irritation.

Treatment.—Arsenic was given, in one form or another, for a period of six weeks and various washes were applied for the relief of the itching, but without any real improvement. About this time the patient began to complain of rheumatic pains in the knees, for which she was given fifteen-grain doses of salol four times a day, and immediately the lichen began to improve, having almost disappeared at the end of two weeks of this treatment. The salol was now stopped and the arsenic tried again; this change in the treatment was followed immediately by an increase in the itching, which again became well nigh intolerable. Sodium salicylate was now substituted for the arsenic, with immediate relief, and this drug was continued until the complete disappearance of the disease. The relief of the itching in this case was most striking.

CASE 3.—*History.*—Mrs. S., aged 55, was referred to me by her family physician for the treatment of a lichen planus on the buttocks and the inner and posterior surfaces of the thighs. The disease had already lasted eighteen months, and the treatment which she had had, which included, among other things, the Roentgen ray, gave her little or no relief.

Treatment.—For a time she was given arsenic, but this had to be used cautiously, since she bore it badly, experiencing

gastric distress even from small doses. She improved, however, slowly but steadily under this treatment combined with the application of an ointment of phenol and mercuric chlorid. After a time she began to complain of pain in the larger joints, and the arsenic was stopped, salol being given instead. The improvement in the lichen was quite as decided while taking this drug as under the arsenical treatment, but not more so. Under the alternate use of the salicylates and arsenic this patient made a complete recovery, but the beneficial effects of the salicylates were less striking than in the cases already related.

CASE 4.—*History.*—A man was recently under observation in the University Hospital, in whom the eruption was unusually extensive, being almost universal and accompanied by almost intolerable itching.

Treatment.—Salicylate of soda was given in 15-grain doses four times a day. Under this treatment there was prompt improvement in the eruption, the papules flattening down and growing paler, and the itching, too, was considerably diminished, although it still continued an annoying symptom. As the pruritus still continued after a week's use of the sodium salicylate, the patient was given arsenic, under which the improvement, at least so far as the itching was concerned, was more decided. In this case the salicylate seemed to be distinctly less useful than the arsenic, although not without favorable effect.

It goes without saying that an experience based on so small a number of cases is inconclusive, but it would seem that the salicylates are of distinct service in a certain proportion of cases of lichen planus, especially in the relief of itching, which is sometimes a most distressing and stubborn symptom; and it would further appear that they are likely to be of most use when arsenic has failed, or, as occasionally happens, has actually increased the patient's discomfort. Their real value, however, can only be determined satisfactorily by employing them in a large number of cases.

SOME UNUSUAL FORMS OF LICHEN PLANUS.

Lichen planus may be regarded as the type of a papular disease, the eruption being, as a rule, remarkably uniform in appearance and distributed on various parts

of the body without any special arrangement. In exceptional cases, however, there may be a more or less marked departure from the usual type, both in the character of the lesions and, more especially, in their arrangement. Instead of the ordinary diffuse eruption there may be an arrangement in circles and segments of circles with no appearance of discrete papules. In a case observed some years ago the eruption consisted entirely of a few scattered, brownish-red, slightly scaly rings and crescents situated on the legs, the whole looking much like a syphilide. This patient had been under my care seven years before for an extensive lichen of the ordinary diffuse type.

Instead of rings the eruption may appear as slightly elevated discs with or without depressed centers, as in the case of a woman observed in the skin dispensary of the University Hospital some years ago. In this patient there were a number of violaceous, slightly scaly discs situated on the flexor surface of the forearms, while on the backs of the hands, the extensor surface of the forearms and tops of the feet the eruption presented the usual appearance.

In rare instances the disease exhibits a band or ribbon-like distribution, sometimes following more or less closely the course of some nerve tract; I have seen two striking examples of this form. The first was in the person of a negro man, 56 years old, in whom a broad band of closely aggregated lichen papules began on the left buttock and extended down the posterior surface of the thigh and outer side of the leg to the ankle, following with considerable accuracy the course of the sciatic nerve.

In the second case, the patient being a woman 43 years old, there was a broad, serpentine, verrucose band which, beginning on the inner surface of the right thigh just above the knee, extended over the anterior surface of the leg to the ankle. In this patient there was also an abundance of lichen papules on the flexor surface of the fore-

arms, but in this locality the disease presented no unusual appearance.

Perhaps one of the most interesting, and at the same time one of the rarest of the aberrant forms of lichen planus, is that in which, along with the usual flat-topped, angular papules characteristic of the disease, there are a greater or less number of variously sized blebs. Only a small number of cases of this kind have been reported, the most remarkable being one observed by Kaposi, in which the number and size of the blebs was so great as to obscure for a time the lichen eruption. In the first case reported in that portion of this paper dealing with the use of the salicylates, this complication was present in a moderate degree. As has already been stated, the patient was an overworked clerk, with a most extensive and intensely pruritic eruption; from the very beginning, according to the statement of the patient, small blebs were observed from time to time scattered about on various parts of the trunk and lower extremities. They were about the size of a split pea, never very numerous at any one time, without any special distribution or arrangement, and ruptured spontaneously soon after they made their appearance.

In endeavoring to explain this departure from the ordinary type of the disease, it has been maintained by some that the blebs were no essential part of the eruption, but were due to arsenic, which is so generally employed in its treatment, a drug which, as is well known in exceptional cases, produces cutaneous lesions of various kinds. In the foregoing case, however, this etiologic factor could be excluded at once, since this drug had not been employed during the first month of the disease, while the blebs were present from the very beginning; and other observers have recorded similar cases. In an analysis of the literature of bullous lichen planus, Whitfield collected the reports of 17 cases in which bullæ were present, and in nine of these he found that no ar-

senic had been taken. It is possible that, in some cases at least, the blebs are the result of traumatism inflicted on the skin by the patient in scratching.

DISCUSSION.

DR. WILLIAM S. GOTTHEIL, New York City, confirmed Dr. Hartzell's observations with one of his own. The case was one of extensive lichen planus; practically the whole body was involved except the face, and including the palms and soles and the visible mucosa. The patient was given arsenic in heroic doses by hypodermic injection, up to 40 minims of a 1 per cent. solution of arseniate of soda and carbolic sublimate ointment locally. Subsequently, he developed some joint symptoms, for which the salicylates were given, and coincident with this his joint symptoms as well as his eruption began to improve. Dr. Gottheil hesitated at the time to attribute his improvement to the salicylates, but wished to place the case on record in confirmation of Dr. Hartzell's observations.

DR. JOSEPH ZEISLER, Chicago, said that four years ago, at the meeting of the Association at New Orleans, and a year later at the Niagara Falls meeting of the American Dermatological Association, he took the ground that arsenic has ceased to be—as it was formerly considered—a specific for lichen planus, and to-day he feels like going one step farther and saying that arsenic is absolutely contraindicated in lichen planus, in spite of the teaching of the elder Hebra, who considered it a valuable remedy in this affection. He said that he has seen a fairly large number of cases of lichen planus, and his experience is that, while the lesions may disappear under the systematic use of arsenic, the sufferings of the patient are intensified thereby out of all proportion to those caused by the disease itself. Many years ago he discontinued the use of arsenic in lichen planus, and he does not expect to treat a case with that remedy again. He expressed surprise that Dr. Hartzell did not give any credit to the internal use of mercury in lichen planus, particularly the protoiodid, which Dr. Zeisler considers of much more value than arsenic. Nevertheless he is glad of the suggestion regarding the salicylates, because mercury, after all, is not an indifferent drug; many patients have a peculiar antipathy against it, and it is well to have another drug to fall back on. He felt like repeating what he said four years ago, that the *x*-rays have an almost miraculous effect on some of these cases, particularly those of the verrucous type. In some of his cases of lichen planus annulatus only one lesion was present; in others there were two or three little rings, very peculiar looking, easily mistaken for syphilis, and consisting simply of an agglomeration of small lichen planus papules.

DR. J. B. KESSLER, Iowa City, Iowa, said that his experience with arsenic in lichen planus corresponded with that of the last speaker, while mercury at times has proved very beneficial. His experience with lichen planus has been very limited. Locally, he prefers applications of Vleminck's solution, beginning with a weak solution and gradually increasing it up to full strength.

DR. GEORGE T. JACKSON, New York City, said that he regarded arsenic as almost a back number in dermatology, though it is very commonly given, by the general practitioner, for all diseases of the skin. In acute conditions arsenic certainly aggravates the trouble, and lichen planus, in its acute form, is certainly made worse by it. Lichen planus is a peculiar disease; it comes suddenly and goes suddenly, and it is sometimes difficult to say how much good treatment really does. It has disappeared under rhubarb and soda, the protoiodid of mercury or the salicylates. In the chronic form arsenic, or the salicylates, or mercury, are of little value. In such cases the *x*-rays, curettage or other energetic treatment must be used.

DR. ROBERT W. TAYLOR, New York City, expressed the opinion that sufficient attention is not paid to the value of the old Boeck treatment in cases of acute and very generalized lichen planus. In an article which he wrote many years ago in the first volume of Dr. Bulkley's Archives of Dermatology, cases were reported which showed the almost magical effects of that treatment on the itching and hyperemia. The treatment consists of 20 drops of dilute nitric acid, taken before meals, and 15 grains of the chlorate of potash, taken in water after meals. He particularly recalled a recent case in which the result of this treatment was most wonderful, and he has seen many similar instances since. He did not know how these remedies act in these cases, whether as anti-rheumatics or otherwise, but Dr. Boeck's idea was that they add oxygen to the blood. Dr. Taylor said that his paper, in which this method of treatment was outlined, was the first paper on lichen planus ever written in this country. That was about 1871 or 1872.

DR. L. DUNCAN BULKLEY, New York City, said that last year at Boston he spoke very strongly on the treatment of lichen planus, and stated then that for the past thirty years or more the remedies mentioned by Dr. Taylor have been his almost constant stand-by in lichen planus. While he should not hesitate to give the salicylates a trial, he had the greatest confidence in the use of nitric acid and chlorate of potash. His method is to give the chlorate of potash up to 10 grains, dissolved in water immediately after eating, and the nitric acid thirty minutes or an hour later; beginning with three or four drops of the strong acid three times daily, he increased it even to six or eight drops, if necessary. He is sure that this method of treatment, in the acute form of lichen planus, re-

lieves the irritation and prevents the development of new lesions. He has not given arsenic in lichen planus for many years, excepting in some long-standing cases that resisted other methods of treatment, in some of which arsenic, if administered properly and with other remedies, acts beneficially. He seldom gives it alone; almost always in combination with iron and alkalies. He agreed that the *x*-ray and the hypostatic current are of very great value in the old verrucous forms of lichen planus, especially of the lower extremities. He has seen such patches melt away almost like magic under the influence of those agencies. He has given mercury in some cases of lichen planus, but has seldom found it necessary to resort to it, on account of the good results from the treatment first mentioned.

DR. W. T. CORLETT, Cleveland, Ohio, agreed as to the uselessness of arsenic. After visiting Dr. Crocker's clinic, a few years ago, and seeing psoriasis treated with salicylates, he put a number of patients on the drug, but was disappointed in the results. From what he had seen in London, however, he did not expect anything very striking. He hoped the salicylates would prove more effective in lichen planus.

DR. M. B. HARTZELL, Philadelphia, said that his paper was on the salicylates in lichen planus, not the treatment of lichen planus. It was not his purpose to discuss at length the treatment of this disease, nor could he agree with the statement that arsenic is entirely useless. In one of his cases of lichen planus arsenic was very effective and the salicylates only moderately so. In one instance the pruritus and general discomfort improved very markedly under the arsenic. He does not think lichen planus dependent on a rheumatic diathesis. He considers mercury a valuable drug in some cases. One of his patients who had suffered from lichen planus for eighteen months had been very thoroughly *x*-rayed, with the sole result of stirring up the lichen planus and making it much worse. That was his experience with the case of the woman whose photograph he showed; this case was of the verrucous type, with lesions on the leg and thigh. The *x*-rays set up a dermatitis and increased her discomfort very much. He would not resort to it again in lichen planus. The carcinate type of lichen planus was referred to by one of the speakers. He recently saw a case with two rings, one on the forearm and one on the face. The two patches were not larger than a dime, both ring-shaped, the rest of the body being entirely free.

ROENTGEN RAY TECHNIC IN DERMATOLOGY.

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The value of Roentgen rays in the domain of dermatology has been thoroughly tested and cordially approved. Its place in medicine, as a therapeutic agent, is now established on a sound and rational basis. I have, therefore, attempted to prepare a brief paper on "Roentgen Ray Technic in Dermatology," because the technic, or, if you wish, the art, the skill of application, is the one great prime essential demanded of every operator, if he would attain the very best possible results. So diametrically opposed are the announcements made relative to the value, the uses and the results attained by the Roentgen rays in cutaneous affections, that an explanation for these varying opinions must be sought in the differences in technic employed by the great army of *x*-ray therapists the world over.

Needless to say, the Roentgenologist must be an adept at his work. The hand of the tyro holds no comparison with the experienced operator in this field of endeavor. In Roentgen diagnosis differences in technic result in excellent or defective skiagrams. What is true here holds equally well in the therapeutic application of the rays. In order to employ this agent so that satisfactory results may be obtained, it is primarily essential that its use as a diagnostic means should be perfectly mastered, and that the operator have more than an ordinary knowledge of the principles involved and likewise an

easy familiarity with the manipulation of the apparatus.

Like all new and growing sciences, this subject is beset with embarrassing inconsistencies. In a certain skin disease one learned authority declares that the employment of a soft tube is imperative; while another decries the soft tube and asserts that a hard tube alone in that special case is effective and permissible. Some specialists condemn the repeated and gradually ascending serial irradiations, urging the massive dose treatment as the most logical and curative. Others give anywhere from one to six séances weekly, believing that massive does are ineffective and dangerous. There are many excellent students of the science who are assured that the production of an erythema of varying degree is essential to a cure. Scores of other *x*-ray workers denounce any such procedure as wrong in conception and at variance with the dictates of good judgment. Coupled with such flagrant contradictions are all sorts and manner of opinions as to the distance of the tube; these vary from 1 to 3 inches from the part, all the way up to 25 to 40 inches, and even more; it is, therefore, necessary to determine some arbitrary rules that will give the most effective quality and quantity of the rays applicable in diseases of the skin.

Incidentally I may remark that, while variations in the technic for each and every special case is imperatively demanded, the one great *desideratum* is the determination of the *quality* of the rays best adapted for the particular case under treatment. The distance of the tube, the duration of treatment, etc., have a minor value and are of secondary importance in technic. The most important factor is the selection of the rays most suitable and best adapted for the cases under consideration. The complex nature of the Roentgen rays offers no alternative to the operator in our present state of knowledge; he must always employ the same compound rays, but the preponderant quality of rays in any bundle

can be approximately determined and regulated. Resolution into their component parts has thus far baffled the skill of the physicist and yet we can judge of the quality we are employing.

From Roentgen therapist's standpoint, dermic lesions may be classified as follows:

1. Where slight stimulation is required (acne).
2. Where epilation is necessary (hypertrichosis).
3. Where absorption of pathologic tissue is desired (eczema, psoriasis, lupus).
4. Malignant types of disease (epithelioma).

The technic will, of course, vary with the special character of the lesion to be irradiated. This may be accomplished by varying both the quality and the quantity of rays, which takes into the consideration the vacuum of the tube and its distance from the part to be treated, duration and frequency of the exposures, etc. The apparatus required for effective treatment is practically identical with that employed for skiagraphic work. For therapeusis, a coil of 7 or 8 inch (18 or 20 cm.) spark length will suffice, but it must be used properly and be of good quality.

In superficial cases, the irradiations should be mild in character, thus producing but slight stimulation. In these cases it is our aim to bring about a constructive, not a destructive, condition of the affected area. From a soft tube rays emanate capable of specially effecting tissue in the vicinity of the superficial papillary network, but liable to bring about atrophy and telangiectasis, with the production of epilation. They are most applicable in such affections as psoriasis, eczema, rodent ulcer, etc., the intensity of current, distance of tube, and frequency of application altering the effect.

In deeper structures hard or medium hard tubes may be employed. We may call into requisition the medium tubes when the deeper structures are to be treated, with but little effect on the superficial layers, as in hypertrichosis. In using a hard tube, it is essential that the less easily penetrating rays be filtered, prior to the pas-

sage of the remaining rays to the deeper-seated structures. It should not be forgotten that lengthy irradiations with soft tubes will not affect the deeper parts, because the great number of rays will suffer absorption by the cuticle.

DISTANCE OF THE TUBE.

The distance of the tube from the part depends on the quality of the tube, on the size of the area to be irradiated and whether a rapid reaction is desired or not. By some it is asserted, in theory, that the distance of the tube from the part should be proportional to the height of the vacuum and inversely as the part to be affected is distant from the surface. As a rule, hard tubes should have an anodal distance of from 12 to 15 inches (30 to 38 cm.) from the area to be treated; with soft tubes 6 or 8 inches (15 or 20 cm.) is effective. The current should be generated by an induction coil.

The interrupter most frequently employed in this connection is of the mechanical type; its two prominent advantages are the ease of its manipulation and its cleanliness. The duration of irradiations is dependent on the source of the current (coil or static machine), on the patient's susceptibility and largely on the nature of the affection. As was intimated previously, some authorities advocate brief, frequently repeated exposures, gradually increasing the dose; others approve of massive doses at longer intervals.

FREQUENCY OF THE IRRADIATIONS.

The frequency of irradiations will naturally depend on several factors: character of the lesion, rapidity of action required, duration of each séance, and the distance of the tube from the lesion. It would seem the part of wisdom to expose the patient twice or thrice weekly for the first two weeks, and then to discontinue treatment for a similar period of time, seeking in the interval for the occurrence of any untoward signs or symptoms. Very close observation is imperatively demanded when treatment is administered every other day.

Some prefer this serial method, but the patient's susceptibility must never be lost sight of; if, however, vigilant care is exercised to see that the affected area is not overexposed, then the applications may be arranged more closely together for an almost indefinite period.

I regret that progress in Roentgen ray technic in the past five years has not kept pace with the progress of time. What was empirically true then is empirically true now. Two great questions were propounded then: What is the true nature of the rays? What is its physiologic action on the human tissues? To-day these queries remain unanswered. The progress made and the advances wrought throughout this period are referable to the many and varied improvements in the apparatus.

QUALITY AND QUANTITY OF RAYS.

The methods employed for estimating the quality and quantity of the rays is a subject of paramount importance. By quality I mean the property that these rays possess of penetrating the tissues; some pencils of these rays may penetrate quite easily; on the contrary, others may be less penetrating, becoming readily absorbed by the tissues.

For estimating the quality of the rays, I employ the following methods: Amount of current going to the primary coil, viz., volts and amperes; length of spark in parallel gap; milliamperage of the secondary induced current; radiochromometer of Benoist.

By the quantity of the rays I mean their total action on the tissues, as is manifest by the duration and the effects of the irradiation. I measure by the amount of current passing through the milliamperemeter and the length of irradiation and distance of tube from patient.

SPECIAL TECHNIC.

In a brief paper such as this, I will content myself merely by touching on the technic that I employ in some common dermic affections. This must necessarily be only the average technic as it varies with the individual case.

1. *Where Slight Stimulation Is Required (Acne).*—This form of disease requires the most mild action of the *x*-rays, the irradiation just strong enough to cause a slight stimulation. The production of an erythema is not desirable, especially when the lesions are situated on the face. Atrophic condition of the pitted areas may result where the follicles are advanced in the disease. Pigmentation rarely occurs and should never be permanent.

This treatment may need to be repeated several times, but the first course of treatment often causes the disappearance of the acne. A medium vacuum tube equivalent to from 2 to 3 inches (5 to 7.5 cm.) spark length, anode from 12 to 18 inches (37.2 to 45 cm.) from the part, 1 to 2 milliamperes in the secondary coil, about No. 3 of the Benoist scale; three exposures a week for two weeks, with a duration of from 2 to 3 minutes.

2. *Where Epilation Is Necessary (Hypertrichosis, Fagus, Ringworm).*—In the treatment of these conditions utmost care should be exercised in order to prevent ill results, and to obtain the desired effect, the parts often affected being the face and chin or upper lip. The utmost care is necessary to ascertain the susceptibility and the dosage. Blondes often show a greater susceptibility to the action of the rays than do brunets. I have been in the habit of irradiating first other portions of the body, for example, the arm, in order to gauge my dosage; then after approximating the dose I irradiate the face, etc. The treatment should be just enough to cause the gradual atrophy of the hair follicle without producing any erythema. After first epilation let two or three weeks elapse and then irradiate mildly in order to render the epilation permanent, being careful, however, not to cause any pigmentation or telangiectasis or pitting of the face, protecting well the portions that it is not desired to erradiate. Erythema of the skin is not necessary, but in spite of every precaution it often occurs; for such an accident cease the treatment and apply zinc oxid ointment.

A medium soft tube at a distance of from 15 to 20 inches (27 to 50 cm.) from the face, with a spark length (parallel) of from 1 to 4 inches (2.5 to 10 cm.) always with mechanical interrupter, 1 to 2 milliamperes, B scale No. 2 to 4, beginning with 2 minutes each exposure thrice weekly first two weeks and then increase up to 2 or 3 weeks. Cease then and wait for several weeks; do not be hasty; let the action of the rays work gradually.

3. *Where Absorption Is Required (Eczema, Psoriasis, Lupus, Etc.).*—The treatment of this group of cases can be approximated in a single form of technic because there is so much variation that the conditions overlap each other in severity and the essential is the production of resolution and absorption. It is impossible in a brief summary of technic to point out more than the result desired and a technic which can be varied to suit the individual case. It suffices to say that the same technic as above, varied by more active rays, i. e., a lower vacuum, and a closer distance of tube with longer exposures, will produce a severe reaction, the intensity of the reaction being regulated by the disease under consideration and its clinical manifestations. For very intense reaction which is seldom employed and only in very resistant cases by expert clinical observers, the following technic is permissible: Tube showing the cathodic stream very faintly and only slight green fluorescence. Parallel resistance ¼ to ½ inch (0.5 to 1.2 cm.), the anodal distance varies the intensity of the effect, as also the milliamperes, as this tube is capable of carrying a very high amount of current even with a weak coil. The distance can vary from 6 to 8 inches (15 to 20 cm.), the intensity of effect corresponding. The milliamperage likewise can range from 1 to 6 milliamperes. The duration of each exposure also depends on the reaction desired. These treatments can not be repeated until the effect of a previous treatment has been observed. They are very severe and dangerous, treatments, unless em-

ployed by an expert clinical observer, should seldom be employed.

The average treatment for these lesions is a soft tube without cathodic rays, having a parallel spark resistance of about 1½ inches (4 cm.) to about B 2. The current should not be over 2 milliamperes. This treatment can be given with care three times a week with a duration of 5 to 10 minutes. The resistance of the tube or its penetration must be varied if resolution is delayed in deep seated foci. This depends on the clinical result observed.

4. *Malignant Types of Diseases (Epitheliomata).*—Certain factors must be considered in irradiating these growths, viz.: the character of the lesion, its rate of growth, location, glandular involvement, age of the patient, the state of health, etc. When the epithelioma has grown rapidly, I advise an immediate operation and subsequent *x*-ray treatment.

The severity of an epitheliomatous growth is largely dependent on the proximity of the lymphatic chain of glands. Thus, an ulcer of the lower lip is less favorable. For cutaneous epitheliomas, place the anode of tube about 10 or 12 inches (25 or 30 cm.) distant from the part with a soft medium vacuum, giving a spark length (parallel) of from 1 to 2 inches (2.5 to 5 cm.), irradiate thrice weekly for three weeks, duration of each séance being about 6 or 8 minutes, 1 to 2 milliamperes passing through the tube, Benoist's No. 2 or 3 scale.

Roentgen dermatitis may involve both the operator and the patient. As to the patient, the development of a Roentgen dermatitis is very prone to occur in irradiating cutaneous affections. It, therefore, becomes incumbent on the operator to watch most carefully for the appearance of the earliest symptoms, such as itching and erythema. It seems proper to remark just here that many operators aim to bring about a slight erythema, urging that its production exerts a curative action on the affection being treated. Other operators incline to

the belief that a moderate tanning of the skin is a desideratum.

It is always my aim to prevent an occurrence of either of these effects. Individual susceptibility, the peculiar location of the lesion, faulty technic and inexperience of the operator, are all factors that increase the frequency of Roentgen dermatitis.

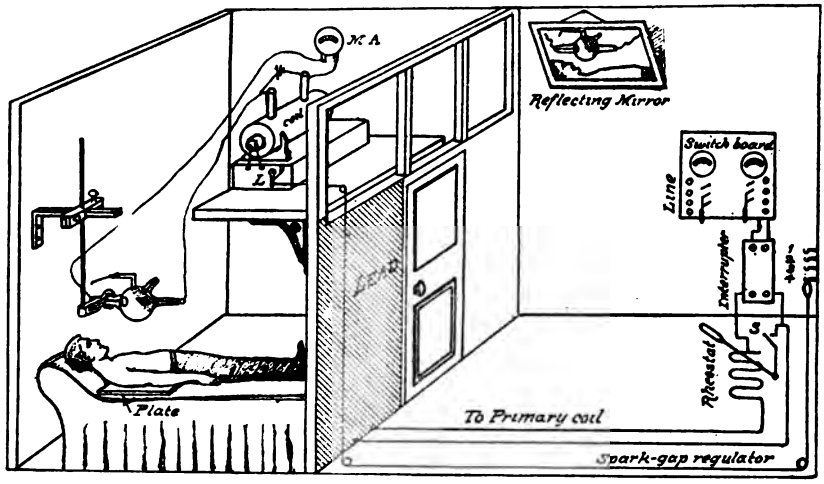
To lessen the likelihood of this complication, many advise that the Crookes tube be covered with sheets of thin lead, or encased in a box lined with lead, or that it be painted with some opaque material. A very clever device is to have the active hemisphere made of lead glass and provided with various sized diaphragms, as is well exemplified in the Piffard vacuum tube. My own personal preference is the rubber shield and diaphragm, the patient being at the same time protected by sheets of lead that have been previously grounded.

In order to diminish the quantity of the soft or less penetrating rays and to effect their absorption, the employment of filters is commended by some practitioners. Maragliano eliminates the non-penetrating rays by the use of diachylon (as a rule, disposed in a thickness of four layers), which readily adheres tightly to the skin. Pfahler and Schamberg advocate the use of wet leather, but the fact that moisture and leather absorb the rays to a too great extent and that consequently a limited quantity of rays is sent to the diseased area, my own preference reverts to the employment of a thin sheet of aluminium, 1/32 of an inch (1 mm.) in thickness (grounded), which eliminates most largely the soft rays, and is a valuable accessory to the *x*-ray worker in his treatment of the deeper structures. In treating some conditions this must be omitted.

As I have said previously, it is the duty of the Roentgen therapist to watch most carefully for the oncome of cutaneous itching and the appearance of slight erythema; if the first stage of a dermatitis seems imminent, the operator should immediately cease with the irradia-

tion. I at once purge the patient, apply zinc oxid and employ cold compresses. In cases of vesiculation, I incise and drain the serum. When the dermatitis is of the second degree I approve of the use of a normal salt solution applied on a compress. I do not favor the employment of carbolic acid solution, corrosive sublimate solution, etc. One of the best dressings is simple sterile gauze.

It is with sincere regret that I am compelled to say that there is no known curative agent to meet that very



distressing condition, unfortunately too well known to my associates, namely, chronic Roentgen dermatitis. It is my belief that meddlesome interference is undoubtdly the cause of much suffering, of loss of fingers and hands, and, indeed, of many precious lives. There is entirely too much medication, and the application of injurious and irritating liniments and ointments.

I am getting relief from the dermatitic condition of my hands by as little medication as I can conceive. I immerse them in hot water for ten minutes daily and apply a slight quantity of cold cream or lanolin to pre-

vent cracking of the skin, completing the details by encasing the fingers in sterile gauze.

For the past five years I have avoided remaining in the same room with the patient, devising a reflecting mirror that is placed at an angle on the ceiling, which, of course, faithfully reveals the fluorescence of the tube and the position of the patient. I occupy a place in the adjoining room, whose partitioned wall is lined with layers of lead, one-half an inch in thickness (see illustration).

In an experience of 8,000 exposures for diagnostic purposes, I accidentally produced epilation once and erythema once; my assistant produced dermatitis once, in a fluoroscopic examination of ten minutes' duration, while examining for gastroptosis.

I always warn my patients of the possibility of some ill effect from the action of the rays. When about to treat acne and hypertrichosis, I pronounce this admonition with even greater emphasis.

THE THERAPEUTICS OF TUBERCULOSIS OF THE SKIN.

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It may be deemed axiomatic that wherever tubercle bacilli find a resting place in an organism and there set up their characteristic histologic changes, if the focus be so localized that it may be removed entirely, by any agency whatever, this removal will constitute a cure of the disease.

On the recognition of this depends the value of any treatment for tuberculous lesions of the skin. Careful study of microscopic sections of infiltrative types of lupus immediately shows why many of the measures proposed for treatment have no value, except as mere palliatives for some of the annoying symptoms. I have too often seen the claim of a cure made when all that had been accomplished was the temporary healing of an ulcerating surface, the claimant being entirely unaware that a non-ulcerating patch of lupus is often more difficult to get rid of than one that has already broken down.

All tuberculous lesions of the skin are granulomata and consist of an infiltration of small round cells, accompanied by giant cells surrounded by a zone of epitheloid cells, sometimes but not always containing tubercle bacilli.

The ease or difficulty of treating a patient successfully depends on the depth of the tubercle deposit, its extent, its situation, the resistance of the subject to the bacillus of tuberculosis as evidenced in his anamnesia, and the

character of the local remedy selected for its control, and the vigor with which it is used.

An internal treatment to be effective alone must cause the tuberculous patches to disappear and perfectly cicatrize. There are no remedial agents which may be depended on to work this wonder, though it sometimes seems as if the goal were about to be reached. Physicians may be deceived by the common experience that chronic lesions of the skin get better or worse, following more or less favorable hygienic surroundings, and are apt to attribute the betterment to some drug given, when the fresh air, sunshine and the improved digestion are the factors which have produced the change.

All dermatologic works repeat parrot-like the injunction to give plenty of cod liver oil to lupus patients. In young persons where its absorption can be assured without digestive disturbances it may be given daily as an inunction in doses of 30 c.c. to 60 c.c. It is best given after a hot bath and in a warm room. I have many times been convinced of its definite therapeutic value in the treatment of tuberculous conditions of all kinds. The objections to its use in this manner is the intense fishy odor which the following formula nearly does away with:

℞.	Heliotropin	gr. iii	18
	Adeps lanæ	ʒvi 180	
	Olei morrhuæ	ʒix 270	

Given by the stomach I think it will more often act as a hindrance to the cure than as an accelerator. Arsenic, if it is tolerated, more particularly if combined with manganese, iron and the bitter tonics, is a valuable adjuvant as a roborant. But mercury in doses of gr. 1/6 (0.01 of the hydrargyrie iodideum viride in the form of Garnier pill, or gr. 1/32 (0.002) of hydrargyri chloridum corrosivum given two or three times a day, the same precaution being observed with regard to keeping the mouth clean as when mercury is given to syphilitics, is of decided value in the treatment of dermal tuberculosis. This is without relation to hybrid

forms where the syphilitic admixture is manifest and the necessity for specific treatment imperative.

It is difficult to say exactly what value the derivatives of Koch's tuberculin may have in the treatment of tuberculosis of the skin. As a diagnostic agent its importance in doubtful cases is unquestionable; as a therapeutic agent, in times gone by, it has been worse than a failure. I believe that a more general knowledge and application of the opsonic therapy of Wright may demonstrate its great usefulness.

In addition to roborant measures one must use local applications or procedures, having always in mind the necessity for the complete removal of the diseased tissues and the varying grades of infiltration, malignancy and destructiveness of the disease process induced in different people by the irritative action of the tubercle bacillus.

Whatever local measure is used and whatever the apparent success attending its use, the pathology of the disease must never be forgotten. Just so long as one "tuberculome" is left anywhere within the limits of the diseased skin, lupus is not cured. It is only after years of observation of the absence of lesions that we can positively affirm a cure.

LOCAL METHODS.

These local methods may be classified conveniently following Brocq[1] and Leloir[2]:

1. *Bloody:* (a) Ablation, (b) curetting, (c) scarification, (d) electro-cautery or Paquelin cautery.

2. *Elective caustics:* (a) Salicylic acid with creosote, (b) pyogallic acid, (c) silver nitrate, (d) silver lactate, (e) lactic acid, (f) Liq. antimony chlorid, (g) electrolysis.

3. *Light rays:* (a) Phototherapy, (b) radiotherapy, (c) heliotherapy.

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1. Brocq (L): Traite Elementaire de Dermatologie Practique, Paris, 1907.
2. Leloir: Traite de Scrofulo, Tuberculose de la Peau Paris, 1892.

The choice of method depends on the type of disease and the individual to be treated. Phototherapy, in my mind, is the ideal treatment for the deeper forms of lupus. It is powerful for good and, so far as I can learn, never harms. Its drawbacks are such as preclude its general use. Departure from the method worked out by Finsen[3] does not seem to be successful. "Better than Finsen's" apparatus has from time to time appeared in the market, but it does not stay, because time and a careful observation of little things are essential elements in the contract to cure by the Finsen light. The element of time itself is prohibitive excepting when the disease is confined to a small space, or in the case of those who can not pay at all, or those who can pay anything asked. It is a treatment for the very rich or the very poor.

Radiotherapy in the hands of skilled Roentgen-ray operators has accomplished wonders in the treatment of lupus. I have time and again seen it cure tuberculous fistulæ, soften and break down the dense scars of sclerosed lupus, and melt scrofula-tuberculous gummæ about the mucous orifices, where repeated and prolonged surgical measures had failed to relieve or cure. I have as often seen it fail to permanently destroy more superficial forms of ulcerative tuberculosis of the skin, and have twice seen it apparently establish on such lesions epitheliomatous changes requiring radical surgical intervention. Even very recently I have seen new tuberlomes develop in surrounding tissue during the daily treatment of a sclerous patch of lupus. Quite often I see deformative telangiectases occur in the scar, and fresh outbreaks from unobliterated lupus nests are not of uncommon occurrence in cases discharged as cured.

Notwithstanding the improvements in apparatus and operative technic, the Roentgen ray is not a safe agent for the unskilled to use. The best operators from time to time occasion, by the very necessity of the intensity of ac-

3. Finsen and Bie: Mitteilungen aus Finsens Medicinske Lysinstitut in Kopenhagen, Leipzig, 1903.

Fig. 1.—Excision of tissues about the canthus and of the right lower eyelid (one-half) for cancer developed on a patch of lupus; defect replaced by flap-sliding; nose treated by curettement and zinc chlorid solution; chin treated with arsenic paste. Photograph unretouched.

tion required in affecting deep seated lesions, very distressing attacks of dermatitis, though they uniformly dislike to acknowledge it, and "burns" are not uncommon with ignorant and irresponsible operators. Add to the frequent uncertainty of its curative action the initial cost of the machine and the heavy charge of maintenance, and we easily see why the greater number of cases of lupus will always have to be treated by other methods. It is of these that I more particularly desire to speak. They, too, are of most value in the hands of experienced and skilled persons, but their success is dependent on observation and patience more than anything else and they require no great outlay of time or money.

ABLATION.

There are a certain number of cases of dermal tuberculosis which are so situated that ablation is easy and absolutely successful. No medical man should ever undertake to remove any malignant neoplasm by operation if he is afraid of losing his professional reputation by the deformity of the scar which may result therefrom. The first essential is that the new growth be removed in its entirety, that the incision be wide enough from the margin of the diseased area to go all around and beneath it until sound tissue is reached for the healing and that all structures intervening—skin, muscle, bone or tendon—be removed. Defects may be nicely tailored by flap sliding or skin grafting. Lang[4] has been the chief exponent of recent years. His reports of results are excellent and he has the courage to apply it to lupus of almost any extent. I have had good success from ablation and present here illustrative cases:

CASE 1.—A woman, aged 65, with disseminated lupus of the face of two years' duration (Fig. 1). At the right inner canthus an epithelioma had developed on a tuberculous base. The photograph shows the results obtained by excision and flap sliding. More than one-third of the lower lid was entirely removed and a new one fashioned from the cheek

4. Lang (Edward): Ergebnisse von 240 Operiten Lupus fallen etc., Wien. 1905.

(Fig. 2). The tuberculous process had involved the outer third of the orbital plate of the frontal bone and the entire outer part of the orbital plate of the malar bone, and the overlying skin and muscles. These tissues were excised and the wound healed by granulation as it was impossible to cover the defect by flap sliding or skin grafting. The other patches on other parts of the face were removed, some by arsenic paste, some by curetting and the application of a 50 per cent. zinc chlorid solution. This woman was treated for six months by a competent and skilled Roentgen-ray operator, the disease continuously growing worse.

CASE 2.—A non-ulcerating patch of lupus (Fig. 3) was removed from the lumbar region of the back of a woman, aged 39, on whom it had existed from her fifteenth year, slowly extending year by year. Note the depth of the tissue removed, the disease extending almost to the muscle beneath. This patch was 9 cm. (3½ in.) long, 9 cm. (3½ in.) wide, and 6 cm. (2⅜ in.) deep. Recovery by granulation was complete in four weeks. She would not agree to skin grafting. She had received treatment for three months every second day by the Roentgen ray from an Omaha specialist without benefit. It was painful when she came to me, and this feature she stated developed during the Roentgen-ray treatment.

CURETTING.

The value of this method of attack on tuberculous foci depends on the thoroughness with which it is done. It is necessary to use firm sharp instruments, both large and small, of the Volkmann and Besnier types (Figs. 4 to 7). These instruments should always be sharp. Without ruthless destruction of sound tissue the use of the curette must yet almost be brutal in order to be curative. I think spreading of the disease after curetting is only to be feared where gentleness is observed in the operation.

THE ANESTHETIC.

In curetting lupus nodules I always prefer ether anesthesia. The operation may be done under Schleich's method of infiltration anesthesia with a very dilute solution of cocain and adrenalin chlorid in physiologic salt solution. The neighboring skin must be thoroughly cleansed and disinfected and the needle entered well out-

Fig. 2.—Same subject as Fig. 1. Removal of large portion of orbital plate of frontal bone and entire outer and superior orbital plate of malar bone, together with the affected skin; healing by granulation. Photograph unretouched.

side of the diseased area, the infiltration first made all around and beneath the patch in the sound tissues before entering the patch at all. The diseased area should also be mapped out by some indelible substance before the infiltration commences, for the process entirely changes the geography of the neighborhood.

THE OPERATION.

In commencing the operation it is best to sear all of the ulcers and make a few thrusts into any deep-seated nodules or hardened tissues with the electric cautery or Paquelin points heated to a dull red heat. This disinfects the débris of the first curetting and renders it surprisingly easier, particularly in sclerotic forms. The whole area of disease should be gone over thoroughly with the larger curettes; then each softened area is entered with the smaller ones, enough force being used to remove all obviously diseased tissue and also to break down the bundles of tissue fibers between outlying lupus nodules. Scissors, knife and forceps may be used to assist in the removal of ragged structures after the curetting.

I believe much of the curative influence observed from the free use of the curette on tuberculous lesions is to be attributed to the inflammatory reaction set up in the surrounding tissues by the mechanical insult causing subsequent destruction of all deposits of low vitality in the immediate zone of operation. The curetting should be slow and thorough until each visible nodule has been broken into and emptied of its contents. The hemorrhage is controlled with hot compresses and any bleeding point that persists may be touched with stick silver nitrate.

It is my custom to cauterize separately each wound with a 50 per cent. solution of zinc chlorid. The application is made by a number of small swabs of cotton rolled on wooden toothpicks. A swab is dipped into the solution and, after shaking thoroughly, applied to the dried curetted nodule and bored into its every nook and

cranny. This cauterized surface immediately starts to bleed again, a compress moistened in a hot weak corrosive sublimate solution is applied to it, a fresh swab obtained and a similar application made to each and every one of the exposed nodules. The parts curetted are finally well washed with alcohol and a moist dressing, made by adding boric acid, seven parts, and salicylic acid, one part, to hot water, one thousand parts, and which is commonly known as Thiersch's solution, applied.

The dressing is removed twice a day or oftener if the comfort of the patient requires it, its continuous moisture is assured by a covering of gutta percha tissue. The slough from the zinc comes away usually in less than ten days, and the wound is nearly always healed before the fourteenth day. Where there is a doubt existing as to the amount of tissue involved, and it is desired to clearly map out the infiltrated nodules beforehand in non-ulcerating or dry forms of lupus, this may well be done by the application for a few days of a thick plaster made from common rosin kitchen soap or a 25 per cent. plaster of salicylic acid or Biersdorf's 20 to 40 salicylic-creosote plaster mull, or a 50 per cent. pyrogallic acid paste.

Formerly it was my custom to use the galvano-cautery or the Paquelin cautery to each nodule after curetting. I am satisfied, however, that this is bad practice, for it is frequently followed by keloidal scars. I think it is more useful beforehand to disinfect the ulcerated surfaces and render curettement easier. Should nodules subsequently be observed in the scar they may nearly all be treated and removed by the agents referred to under elective caustics. It sometimes may be necessary to curette portions of the patch again.

LINEAR SCARIFICATION.

Another bloody method which at one time had great vogue but now has fallen into disuse is that of multiple linear scarification as practiced by the celebrated teacher,

Fig. 3.—Patch of skin and deeper tissues removed from back of woman. Non-ulcerative lupus. Size, 9 cm. by 9 cm. by 6 cm.

Fig. 4.—Prince Morrow curette.

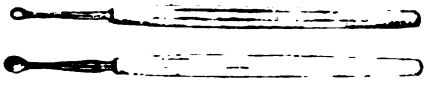

Fig. 5.—Besnier curettes.

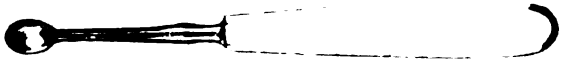

Fig. 6.—Volkman curette.

Fig. 7.—MacGowan curette.

Vidal. Properly carried out, this gives the least deformative of scars following treatment of severe cases of lupus. The objections to it are that it is painful, incurs the loss of considerable blood at short intervals, and the treatment lasts for almost, if not quite, as long a time a phototherapy. American patients on the Pacific coast are reluctant to submit to it, and I use it only in special cases for definite reasons. It is warmly advocated by Brocq,[1] who, trained in the San Louis Hospital, shows plainly in his therapeutics the influence of Vidal and Besnier. In lupus of the eyelids, lips and nose, where the individual is young and her calling is such that unsightly scars will take away her occupation, and she is so anxious to be healed that she will cheerfully endure the repeated infliction of pain, this is the method I prefer to use. It is also of definite value in assisting the Roentgen rays and fibrolysin injections in softening up hard dense cicatrices that are not keloidal.

CAUTERY.

The cautery method, in my opinion, is not to be commended in the treatment of lupus unless the area is very minute and the subject will not allow an excision. The electro cautery is preferable. A suitable cautery point should be selected, heated to a dull red glow and introduced into the nodules. The tissues should be roasted until not only the lupus tissue but a little of the sound skin is destroyed, for the electric cautery, unless its action be forced or repeated, acts very superficially.

The local remedies which have been proposed from time to time for the cure of lupus are legion. But few of them have any real value, and the apparent usefulness of many of them is based on the natural history of the malady and the credulity of their advocates.

Those which the experience of many people has demonstrated as of worth I will now refer to. These remedies may easily be obtained anywhere, do not necessitate

great waste of time for the patient and require no great outlay of money by either physician or patient. They will effectually destroy nearly all of the superficial tuberculous patches. They are of great value in mapping out diseased areas before curetting or applying the Roentgen ray, and in the treatment of isolated nodules which may be left or which may appear from time to time in the scar or its neighborhood after curetting or radiotherapy.

SALICYLIC ACID WITH CREOSOTE.

The Biersdorf people in Hamburg make a plaster mull which contains 40 per cent. creosote and 20 per cent. salicylic acid, which is the best method of applying these drugs in the treatment of lupus. Given a patch of lupus, no matter how extensive, ulcerated or non-ulcerated, the mode of application is the same. A pattern is made of the part to be covered and the mull cut of the same size and shape. Then many small snips are made in the plaster by folding it straight across and cutting it with the points of scissors. The protecting gauze is then removed and the plaster applied. There is no difficulty about it adhering, for it is very sticky. If the lupus patch is crusted or covered with scabs they should be softened and removed first. It acts only on the diseased portions of the skin and for a half hour or more after it is applied causes quite a severe smarting pain in the ulcerated parts.

The first plaster is allowed to remain in place for forty-eight hours, and by this time it has marked and mapped out the situation of all nodules lying near the surface of the skin, eaten well into many of the softer ones and broken the epithelial layers over the deep ones. Its action causes a secretion of an abundant sticky seropus, for the easy exit of which I cut the holes in the plaster before applying it; this dries into irritating gummy crusts and produces a dermatitis of the surrounding skin much like an eczema. The plaster is applied and removed once or twice daily for fourteen days,

the secretion varying with the abundance of the ulceration, but it is frequently sufficient to nearly float the plaster out of place, particularly on the face of males, where it is raised by the growing beard. The pain is rather severe after each fresh application, but is rarely sufficient to require any narcotic.

The appearance of the patch is not unlike that of a piece of wood that has been bored or honeycombed by the teredo. The irregular-edged ulcers are covered by a whitish yellow slough, the necrotic process extending in soft lupus very deep into the skin. Where the plaster has destroyed the nodule entirely it is not uncommon to see it skin over and heal perfectly while the plaster is still in position. After the fourteenth day the plaster is omitted and a moist Thiersch dressing applied until the ulcers heal, which is usually in less than a week. If all of the nodules have not been destroyed by this first course another course may be immediately entered on after the removal of the moist dressing, and a third or even a fourth may be needed to effect a cure.

The following case illustrates the usefulness of this method. A healing being obtained in a most satisfactory manner ten years ago. I have only the photograph of the "after taking," the negative and prints of the original condition having been destroyed in a fire two years ago. The second photograph shows the same person at the present time, April, 1907, when the recurrent nodules are being conquered by the mitigated silver nitrate and liquor antimonii chloridi. The case in its history illustrates beautifully the usefulness of the plaster, of curettage as I advocate it, of cauterizations by silver nitrate and antimony and the complete failure of the Roentgen ray to cure or alleviate.

CASE 3.—Mrs. J. B. O'M., aged 32, housewife, married, of good previous history, was referred to me by Dr. J. T. Stewart Feb. 8, 1897. About one year previously a tuberculous eruption appeared on the anterior part of the left leg and on the forehead. The nodules were small and partook more of the scrofulo-gummatous than of the lupoid type. This had been

treated by local measures, chiefly protective, and antisyphilitic treatment internally without benefit. Plasters of salicylic acid, 20 per cent., and creasote, 40 per cent., were applied by me for fifteen days, after photographing. The ulcerated surfaces were allowed to heal under the boro-salicylic solution, and then the caustic plaster applied for fifteen days more. The photograph (Fig. 8) was taken at this period of the second course. The disease disappeared entirely, but there was a fresh outbreak in September of the same year on the left cheek. This was easily controlled by the same remedies. In 1898 she had a tuberculous ankle joint which was treated by excision of the diseased parts with perfect recovery of joint function. In 1900 she had tuberculosis of the left elbow which also was treated by curetting and the application of zinc chlorid solution, and speedily healed.

In April, 1904, she returned with ulcerating lupus of the face of the butterfly type. She was sent to a competent Roentgen-ray operator and for two months had exposures every two days with positive detriment. Later the 20 to 40 salicylic-creasote plaster was applied with great benefit, but some patches on the forehead, cheeks and lips persistently refused to improve beyond a certain point; they were curetted July 8, 1904, under local anesthesia. This resulted in a practical cure. She has been able to work at her occupation as a copyist ever since. New nodules appear from time to time and are treated by curetting or the application of the liquor antimonii chloridi, mitigated silver stick nitrate, or lactic acid. Her condition at the commencement of April, 1907, is seen in Figure 9.

SILVER NITRATE.

Small nodules may be cured and larger patches treated successfully by the mitigated stick of silver nitrate, whose affinity for and destructive influence on tuberculous tissue seems lately to have been lost sight of. A molded cone of silver nitrate carrying 10 per cent. of potassium hydroxid (caustic potash) sinks into a tubercle of the skin like a knife into a piece of soft cheese, and this is diagnostic, for it does it with no other tissue. It completely destroys all of the lupus tissue it can reach. For tiny nodules or small fistulas a fine silver probe heated in a flame and then placed for a second in contact with the silver nitrate stick melts a portion of it, which immediately fuses itself on the point of the

Fig. 8.—Case 3: taken in 1897 after fifteen days' application of Unna's 20 to 40 salicylic-creosote plaster mull. Photograph unretouched.

probe. This may then gently be forced into the "lupoma," destroying it. The black crust requires no dressing so long as it remains dry, but if pus forms beneath, the eschar should be removed and a moist Thiersch dressing applied.

LACTIC ACID.

Larger ulcers which refuse to progress toward healing may be cocainized with a little of the powder or some 10 per cent. solution and then cauterized with some pure lactic acid dropped on dry cotton packed in the wound. The surrounding skin should be protected with some resin or other heavy cerate. After from ten to thirty minutes the cotton is removed and a Thiersch dressing applied. I have not found lactic acid as useful in the treatment of nodules of the skin as it is in those of mucous membranes, where it has become my agent of first choice.

Silver lactate has the destructive and selective properties of lactic acid and silver in the treatment of tuberculous ulcerations of the skin. I employ it in the form of a 20 per cent. ointment made with simple cerate. This is worked into the meshes of strips of gauze by the hands covered by rubber gloves and used to pack the ulcers. I have experimented with this agent considerably. It is worthy of recognition in the treatment of ulcerative scrofuloderma and lupus. Its drawback is the dirty stain it produces on the skin of the patient and often that of the surgeon, for the lactate, like the nitrate of silver, is decomposed by light rays.

ANTIMONY.

Antimony in the form of liquor antimonii chloridi is a most dependable agent for destroying small lupoma. I modify Unna's method of application. Beechwood toothpicks are dipped into the solution and then inserted in the nodules, which is easy of accomplishment without undue force. They are allowed to remain in position for about ten minutes, even removed and replaced by others if the nodules are deep.

Unna then cuts them off, leaving the points in the skin to slough out. This I do not regard as necessary, but remove them after I think the part is sufficiently acted on by the drug and apply a moist Thiersch dressing, if the cauterized points are multiple or were the previous seat of suppuration.

PYROGALLIC ACID.

There are times when the salicylic-creasote plaster is useless or the sick person objects to its odor. Recourse may then be had to a salve or paste of pyrogallic acid, which also has selective action on the diseased tissues. It is best used as a 50 per cent. paste and, as it acts better in the presence of calomel, I add 10 per cent. by weight of this drug and enough terra silesia to the excipients—vaselin and lanolin—to make a flexible paste. This is spread on linen cloths cut to fit the diseased part, and these cloths should be covered with gutta percha tissue as a protective. The paste is applied in cycles in from five to fifteen days and renewed once or twice a day. Each time it is renewed the ulcer should be cleaned gently with gauze or cotton and as much of the resulting brownish yellow slough picked or cut away as is possible without irritation. The paste should not be omitted until it ceased to have a cauterant effect. After its removal a moist Thiersch dressing usually will be found to be the most satisfactory treatment.

As a résumé of my experience and observation in the treatment of lupus I believe that while the Roentgen ray is, in the hands of a skilful operator, the most effective agent, all the patients can be cured within a reasonable time without it. That success follows persistence on the part of the medical attendant and patience with faith in ultimate recovery on the part of the subject.

COMBINED TREATMENT.

The combined or mixed treatment consists of the preliminary preparation of the field of operation by agents

Fig. 9.—Case 3, showing condition of forehead and face with recurrent lupomes of the upper lip, April, 1907. Photograph unretouched.

that lay bare the lupoma. Then the ulcerative surfaces are sterilized by the electro cautery and this is followed by ablation or curettage, thorough but not mutilating, with broad sharp curettes, followed by smaller and finer instruments of the same nature. This is followed by a second sterilization of the field of operation by alcohol and hot solutions of corrosive sublimate, and the subsequent chemical cauterization by a careful application of a 50 per cent. solution of the zinc chlorid to the curetted surfaces. The wound is then treated by moist dressings of boro-salicylic acid, which acts as antiseptic and keratolytic, until the healing of the ulcers. Careful searchings day after day for residual nodules in the scar, which, if found, are destroyed by the mitigated stick of silver nitrate, lactic acid or liquor antimonii, will effect an apparent and usually a real cure of the majority of cases of the disease within a period of three months, with a cicatrix that is not deformative.

About the eyelids, lips and nose, where the only consideration is to obtain healing with a minimum cicatrix, multiple linear scarification gives best results. Where the lesions are superficial the best treatment is the strong salicylic acid creasote mull or pyrogallic acid paste, with calomel repeatedly applied in several cycles of fourteen days each.

Lupus and various tuberculous lesions of the skin are not rare in the state in which I live, as it has become a haven of refuge for the tuberculous. Strange to say, in Southern California I have seen more cases develop between the third and eighth decades of life than in the very young.

HELIOTHERAPY.

There is another treatment to which attention should be called. This may or may not be original with me. I do not recall ever having read of any one using it, but I have not read everything and there is very little new.

For a number of years I have at times made use of

a kind of heliotherapy in the treatment of sluggish wounds and tuberculous lesions of the skin. This consists of directing the concentrated rays of the sun on large wounds or large lupus patches with large lenses of broad focal distance, and on smaller areas with smaller lenses of lesser focal distance. The effect sought has been double: First, to obtain the stimulation from a kind of exaggerated sunshine on sluggish granulations, and, second, to obtain the destructive effects following the accurate focusing of the rays on definitely diseased tissues.

At first I had great difficulty in obtaining the consent of patients to submit themselves to the cautery effect of the sun rays, as they feared destructive burns and subsequent suffering; but now my assurance that the pain will pass with the treatment and that frequent repetition of the procedure is not necessary usually gains the consent of the subject readily. The treatment is carried out as follows: The subject sits or lies facing the sun. The operator stands or sits in such a position that he can throw the sun rays through the lens directly on the diseased tissues and change the focus of the instrument at will and at the same time observe the tissues which are being treated. The eyes of the operator should be protected with dark glasses, for the effect of gazing steadily at the concentrated light as it moves about the patch is blinding unless the eyes be covered. All of the neighboring parts should be protected with lead foil as is done in prolonged Roentgen ray exposures. The patch of lupus alone is exposed. The lens then is so held that the rays while concentrated are not accurately focused on the diseased structures, and the lens is moved so that the light rays of "exaggerated" sunshine move around and around the diseased area for from five to fifteen minutes, an occasional short rest being taken to relieve the operator's hand and accustom the patient to the treatment. The rays then are focused accurately on some point in the patch and the

Fig. 11.—Case 4, showing character of scars on nose, cheeks and forehead following treatment of lupus by heliotherapy with lenses. Photograph unretouched.

lens slowly moved, the focal distance being kept the same, over the whole lupus area. The pain at the time is quite severe but bearable. The tissues first redden, the individual blood vessels become engorged and expand, grow rapidly edematous, rise above the surrounding tissues and takes on a yellowish brown and then an opalescent tinge. This is the time to cease. In twenty-four hours the cauterized tissues dry into a yellowish crust, which remains in position for a week or two before it drops off, leaving a smooth but slightly depressed and undeformative scar. Any point that escaped may be put to the test for tuberculous nests and submitted to a second treatment. The following case illustrates the value of this treatment:

CASE 4.—Mrs. B. A. G., married, aged 34, came to me April 12, 1905, with lupus of the upper part of the bridge of the nose, extending out on the cheek on each side, the patches having approximately the same size and shape as shown in Figure 10. There was also one patch in the center of the right

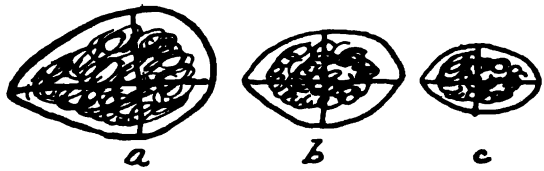

Fig. 10.—Case 4, showing approximate size and shape of patches of lupus; *a*, right side of nose; *b*, left side of nose; *c*, top of nose.

side of the forehead, one small one over the left eyebrow, one within the concha of the right ear, and one on the right cheek over the malar prominence. There was a previous history of tuberculosis of the lungs active ten years ago but cured at the time of consultation. The foci were first treated with the 20 to 40 plaster mull of salicylic acid and creasote and subsequently with antimony chlorid and other caustics. There was much betterment but no cure of the larger patches on the nose, but an apparent cure of the smaller patches in the ear, on the forehead and on the cheek.

Treatment by the lenses and sun rays was commenced June 1, 1906, and one patch was treated at a time at irregular intervals until Sept. 25, 1906, with practically perfect results. No other treatment nor application was made. The character of the scars is shown in the accompanying photograph (Fig. 11). They are not deformative.

TREATMENT OF ACNE AND CHRONIC ECZEMA.

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The successful treatment of acne and eczema means something more than a hasty prescription for a tonic and an external application. Routine treatment without a careful study of the etiology, pathology, stage and type of the disease, shows lack of clinical knowledge. The treatment of any skin lesion demands of the practitioner a sound knowledge of general medicine and experience of the various therapeutic agents employed.

There are probably no two skin lesions in which a larger number of remedies have been employed. Sabouraud states: "There is not a single treatment for eczema, but a thousand, which proves that there is not a single good one."

As every one is familiar with the etiology and pathology, and also with the older routine remedies, an effort will be made to show some of the indications and the contraindications of the Roentgen rays. A great deal has been said and written in regard to the value of the rays in acne and eczema, but a large percentage of cases have not been treated intelligently.

The employment of the Roentgen rays in dermatology is a branch of medicine that demands a knowledge of the disease under treatment as well as a knowledge of the physiologic actions of the rays and the variations necessary to produce the desired results. Then, in order to treat skin lesions with the *x*-ray, the physician should either be familiar with the rays, as well as

dermatology, or else refer his patients where they can have the proper treatment when the rays are indicated. The following replies of Prof. V. Neuman of Vienna and Dr. Leslie Roberts of Liverpool, England, to Dr. Biddle's circular letter, published in the *American Quarterly of Roentgenology* show what divergent opinions exist:

DR. LESLIE ROBERTS, Liverpool: In reply to your questions relating to the *x*-ray treatment, I may say that I consider the treatment of acne rosacea, eczema, or psoriasis by the *x*-rays to be irrational, improper, and utterly inadmissible on scientific grounds. I am afraid that those who talk of "curing" these diseases by rays do not clearly understand the nature of these diseases.

PROF. V. NEUMAN, Vienna: I have had a great deal of experience with radiotherapy of acne, acne rosacea, eczema and psoriasis. There are cases which can not be treated properly otherwise. Of course, I use our older methods in combination with Roentgen rays. Acne of the face and back is often cured radically by a few séances, but acne rosacea, with tumefaction of the nose, is only very little improved.

Chronic eczema, wet and dry form, yield often quickly to the new treatment, but not ulcers of the leg.

Psoriasis in its chronic patches, ought to be exposed strongly to *x*-rays; the acute disseminated form needs only weak séances. The disease is not cured radically though.

The *x*-rays ought to be handled only by specialists; if there are none at hand, the rays ought better to be replaced by our older methods of treatment. But a specialist with much practice, will, by the use of the dosemeter of *x*-rays (Sabouraud, Noire and Kienbock, with milliampere meter) always avoids burns; therefore, in his hands, radiotherapy will never prove harmful.

During the past two years I have visited a number of skin clinics in some of the larger cities and have been impressed with the different methods of treatment and the results. Any one who has gone to the different skin clinics and has studied the cases and the methods of applications of the Roentgen rays and has not depended on a circular letter or some other unreliable source of technic can account for both success and failure of the Roentgen rays in dermatology. In the past, defective

technic has included overconfidence and rashness or timidity in the uses of the rays, and many physicians have not produced results because they were afraid of producing an excessive dermatitis, and have given an underdose.

Whenever there is a reliable meter to measure the kind and amount of rays given off by a tube, dermatologists will be able to employ the rays more uniformly and there will not be such difference of opinions.

ACNE.

After a faithful trial in the mild cases, of both local and constitutional treatment for two months, if there is no marked improvement, then I apply the Roentgen rays, but in pustular and indurated acne time is usually lost by waiting. In this class of cases, the time, in order to affect a cure, is not shortened, but the recurrences are less.

The local treatment of acne consists in the removal of comedones, infiltrates and abscesses. Jacobi states that the employment of sulphur and ichthyol soaps and hot water accomplishes the removal of excessive fat and opens the follicles so that their contents can be evacuated. Subsequent vigorous scaling of the skin is of use, and may be carried out by means of resorcin or napthol paste or by painting with tincture of iodin or iodin glycerin.

Now the Roentgen rays remove the comedones and usually this takes place during the first few treatments; it is most likely due to the first or stimulating actions of the rays. Following this, there is marked desquamation and, thirdly, a decrease in the size of the sebaceous gland.

The first two effects of the rays can usually be accomplished by medication and will generally cure the mild cases, but medication has little or no effect in decreasing the overactive sebaceous glands. In pustular acne, the rays seem to have a fourth action on the staphylococci by rendering the soil inert.

In treating cosmetic lesions like acne, the greatest caution must be used to prevent any undesirable results. It is absolutely necessary to study the quantity and quality of the rays. In selecting an acne tube, one is taken which maintains a uniform vacuum and which can be kept low. A new tube is never used unless the rays are passed through an aluminum filter. I have been in the habit of employing a tube very low in vacuum, one which will scarcely show the bones in the hand, and with the anode placed at eight inches from the skin and with one and a half milliamperes of current passing I give from five to ten minutes' exposure, depending on the condition of the patient, until nine treatments are given. By this time I am usually able to determine the amount of radiation necessary to cure the patient. As it is for the cosmetic results that these patients are treated, and as it is necessary to vary the quantity of radiation necessary to produce the best and most uniform results, three weeks of trial treatment seems advisable. By this method of varying the amount of radiation results should be uniform and all danger of an excessive dermatitis avoided. Probably there is no skin lesion in which a more exact amount of rays is necessary to produce uniform results. It might be compared to radiography, where every one realizes that unless the proper exposure is made no picture is produced. As before stated, the amount of radiation varies with the individual case and may vary as much as in taking a picture of a hand and a shoulder.

ACNE ROSACEA.

Acne rosacea, while more resistant, has yielded the best results when glandular inflammation predominates. The Roentgen rays appear to act in this condition by causing atrophy of the sebaceous glands and by setting up an irritative desquamation. The principal effect is due to the action of the rays on the sebaceous glands. According to Gassman, the cure of acne rosacea is due to a destruction or degeneration of the blood vessels. It

can be readily understood that since the *x*-rays have a selective affinity for glandular structures it requires less radiation to decrease the activity of the sebaceous glands than to cause absorption of the hypertrophic growth of connective tissue or the destruction of the small vessels.

ECZEMA.

Internal treatment is important in a certain percentage of cases, but as a large majority of patients suffering from eczema are in perfect health, and the disease is due to some local cause, local treatment only is necessary. Among the local measures which may be employed are drugs with which all physicians are familiar, and physical agents. Of these, radiant energy is probably the most efficient.

The rays are certainly not indicated in the acute forms of eczema, unless it be to relieve the pruritus which can not be controlled by other remedies, and in most forms of subacute eczema. But in many chronic and rebellious cases which resist other therapeutic agents the *x*-rays have proved efficient. The effects of the rays are most marked in squamous eczema, since it is more chronic and less liable to yield to other forms of treatment. It requires more intense radiation to relieve the pruritus in papular eczema and there is a greater tendency to recurrence than in any other form of the disease. It has been noted by a number of operators that after a few applications of the rays the discharge and itching ceased. The rationalé of Roentgen treatment lies in its stimulation of metabolic processes, especially in chronic inflammations. It has been stated that the rays influence eczema by stimulating the bio-activity of the cells.

In the treatment of eczema by the rays, the location and type of the disease should always be carefully considered, and the indications and the contraindications determined. In deciding on the dose, the character of the lesion, its chronicity and the vitality of the patient

must be taken into consideration. Results can only be accomplished by employing rays in proportion to the condition of the patient. In chronic squamous eczema, the local condition of the skin is poor, nutrition is low and there is little vitality. In these cases more than a mild dosage is liable to result in a severe dermatitis. In some cases it may be necessary to give rather large doses, but the clinical experience of the operator should guide him, and experimental knowledge obtained by milder dosage in the same case should be employed before a severe dose is given. While almost any form of Roentgen treatment may effect a cure of eczema if persisted in long enough, if rays of low penetration are used, the treatment is hastened. A low tube is not only more efficient, but prevents unnecessary exposure of the underlying tissues. With the anode placed at ten inches from the surface, with one and a half milliampere of current passing, providing the patient is in good physical condition, a safe rule to follow is to start with ten minutes' exposure, three times a week, until from eight to ten treatments are given. In my experience, this amount of radiation has been sufficient to clear up the lesions in many cases of squamous eczema, but in some it has been necessary to give a second course of treatment.

DISCUSSION.

ON PAPERS OF DRS MAC GOWAN, KASSABIAN AND BOGGS.

DR. M. B. HARTZELL, Philadelphia, said that we should not lose sight of the fact that patients with lupus were cured before the introduction of the Roentgen rays and the Finsen light. He said that he had listened in vain to hear some one say something about the untoward effects that sometimes result from the Roentgen rays, and with which we are all more or less familiar. He spoke particularly of the marked atrophy of the skin which not infrequently follows the Roentgen ray treatment, and mentioned the case of a young woman who was treated by this method for a disfiguring form of acne; the treatment proved satisfactory, so far as the disappearance of the acne was concerned, but it left her with the seamed and wrinkled face of a woman of 75. Among the cases of eczema that are most successfully treated by this

method are those in which patches occur on the backs of the hands. In these cases he has often seen marvelous results.

DR. G. E. PFAHLER, Philadelphia, said that the papers of Drs. MacGowan and Kassabian impressed on him the fact that in the treatment of these various affections a single remedial agent can not be depended on. One man, with the proper technic and equipment, will get marvelous results from one agent, while another man with the same agent, but improperly equipped, will get poor results or none at all. Dr. Pfahler agreed with Dr. Hartzell that the Roentgen rays may prove harmful, and that they should never be used in cases in which another remedial agent will accomplish the same result. He believes that we are prone to use the *x*-ray too frequently and with too strong a dosage, especially in skin diseases. Nature should be allowed a little more time after the lesions have been sufficiently stimulated. Perhaps the ideal treatment would be to give a single dose, and then await its effects. For the past year he has been trying to perfect the technic for the removal of superfluous hair, and he agreed with Dr. Schamberg that physicians should hesitate in treating these patients with the *x*-ray. In the cases in which he has undertaken it, he has done so under protest. By an exposure of thirty seconds he has been able experimentally to remove hairs without doing any damage to the skin. With this technic, which is not yet completed, the hairs have been removed, but not permanently, and he mentions it as an example of what may possibly be done with the *x*-rays with good technic.

DR. CHARLES LEONARD, Philadelphia, said that he indorses what Dr. Kassabian said in regard to the injurious effects of meddlesome treatment—both medical and surgical—in dealing with an *x*-ray dermatitis. All meddlesome medication should be avoided by anyone who comes in contact with these lesions. The lesions are the result of injury to the trophic nerves, and the vitality of the tissues is much impaired. He has known of many instances in which these lesions were excised in spite of the fact that the surrounding tissues were so much impaired in vitality that it was impossible to expect either healthy granulations or any neparative process. Such treatment simply aggravates the condition; the same is true of the application of irritant ointments. In Philadelphia physicians have learned to let Nature take its course in the care of these ulcers, simply limiting themselves to proper asepsis, and mild stimulation by the use of hot water baths, and application of ointments of the mildest character, such as lanolin and petrolatum in equal parts, with 5 per cent. of zinc oxid. Under this treatment, the chronic ulcers will heal, and the malignant transformation which is said to be so common, is prevented because all sources of chronic irritation are removed, and the devitalized tissues are allowed to regain

their normal vitality, which is essential to reparative processes. In the treatment of lupus, particularly that effecting the nose, Dr. Leonard has seen excellent results following the *x*-ray treatment, with scarcely a perceptible scar. As the papers have shown, successful treatment is dependent on accurate powerful treatment adapted to the needs of the tissues and lesions involved. Failures are certain to result in the hands of those deficient in technic and timid because they are ignorant. This is true of all medication, as has been clearly demonstrated by Dr. MacGowan's paper.

DR. JAY F. SCHAMBERG, Philadelphia, said that he is in general accord with the statements made in the papers under discussion. The Roentgen rays, properly applied, form an important addition to our therapeutic armanentarium. At the same time physicians are less enthusiastic in their claims concerning the results of the *x*-ray treatment in dermatology than they were some few years ago. The *x*-rays are of decided value in acne, but the method should be used in conjunction with other approved measures. Dr. Schamberg has found the treatment more efficacious in the deep pustular varieties than in the mild superficial papular types. In eczema his best results have been obtained in the recurrent vesicular type involving the hands and feet—those rebellious varieties which recur month after month and year after year, and which are comparatively little influenced by other methods of treatment. In the treatment of superficial diseases of the skin, the older methods of treatment found to be of value should be employed and the *x*-rays used as an adjunct and auxiliary in as small dosage as possible. By thus employing the minimum quantity of *x*-rays to assist in effecting a cure, much greater security is assured against producing undesired structural change in the skin.

DR. R. H. MONTGOMERY, Youngstown, Ohio, said that he has never seen any untoward effects from the use of the ray, in spite of the fact that for a number of years he employed them in a comparatively reckless manner. He recalled particularly one enormous epithelioma of the face which he succeeded in curing after the patient had been given up by the surgeons, and at that time he knew little about the proper dosage and technic. He has also used the remedy in acne and lupus vulgaris, with comparatively good results, and so far as he knows, no malpractice suit has ever been brought against him.

DR. GRANVILLE MACGOWAN, Los Angeles, said that he does not know why an old man's skin should not heal in the same way as a young man's. He has operated on many patients over 80, and they recovered after serious surgical operations. The trouble with many surgeons in dealing with epithelioma is that they are a little timid, fearing to remove much tissue lest it should leave a bad scar on the face, which might be

regarded in the community as a reflection on their skill. In his paper he said that there is nothing he could recommend that is new, but there is one method of treatment which he forgot to mention, and which may be new to some; he has frequently resorted to it in the treatment of lupus about the face or hands, with excellent results—that is, the application of the direct rays of the sun. He has seen astonishing results in general tuberculosis from the simple application of the sun's rays as God gives them right out of the clear sky; in California this treatment is possible over 300 days in a year, and it occurred to him that perhaps these rays, if they were concentrated on a small lupoid lesion, would prove beneficial. To make these applications, he employed a small lens for small lesions, and a large lens for large lesions. The operator is placed between the patient and the sun, and with the lens concentrates the rays on the lesion for a period of eight or ten minutes. The treatment is painful, it hurts decidedly, and even a preliminary injection of cocain does not entirely do away with the pain. Under the influence of these strong rays of sunlight the tissues undergo much the same change that we see after the application of arsenical paste. They first become brownish-yellow and then assume a peculiar purplish tint. Within twenty-four hours they dry up into a crust like that observed on old eczematous patches; this falls off in the course of ten days, leaving a perfectly smooth flexible scar.

Dr. M. K. Kassabian, Philadelphia, said that about one-half of the *x*-rays are absorbed in the epidermis and about one-tenth in the derma. He is sorry that he can not agree with Dr. MacGowan that we can use sunlight in this type of cases, and he believes that when penetration is necessary, we must resort to the *x*-rays.

Dr. Russell H. Boggs, Pittsburg, emphasized the importance of the word "conservative." This means that *x*-ray men should not only be conservative, but that physicians who know nothing whatever about the Roentgen rays must not judge good work by a few patients who have not been properly treated. Every year we hear less and less of the enthusiastic *x*-ray men, and instead of that we hear more of the conservative use of the *x*-rays.

LUPUS ERYTHEMATOSUS.

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The etiology of lupus erythematosus remains to the present day an unsolved dermatologic problem, in spite of the somewhat commonplace character of the affection, and the large number of careful and painstaking researches in that direction. Its frequency, notwithstanding its world-wide distribution, is variously estimated. From the records of the American Dermatologic Association it occurs once in three hundred dermatologic cases in the United States, with marked fluctuations with respect to locality. Voirol[1] reports only one case in every 833 cases of a dermatologic nature in Berlin; Crocker reports one in every 55 cases in private practice in London, and Jaddasohn[2] one in every 66 cases (in private practice in Berne), and one in every 78 cases in dispensary and hospital practice.

This seeming disparity is probably more dependent on factors pertaining to personal observation, particularly the ease with which the acute disseminated forms, and mild chronic circumscribed types can be mistaken for obscure types of eczema, simple dermatitis, seborrhoic eczema, psoriasis, etc., rather than epidemic influences or anything pertaining to locality, clime, altitude, vocation, and allied conditions. My personal experience in private practice for the year 1906, shows that it occurs one-third as frequently as acne vulgaris,

1. Deutsche Med., 1903.
2. Mracek Hand-Book, 1904, iii, 385. (This handbook contains a complete bibliography.)

as frequently as acne rosacea, slightly more frequently than psoriasis and scabies, seven times as frequently as lupus vulgaris and constitutes 34 per cent. of all dermatologic cases. The relative far greater frequency of tuberculosis cutis makes lupus vulgaris from statistical records a much more frequent affection in Europe than lupus erythematosus, whereas the converse is true in America.

Lupus erythematosus is a noteworthy affection in regard to marked variation in the clinical character of the chronic types. Kaposi's[3] convenient and generally accepted division of the affection into the acute and chronic forms, requires no special comment, and inasmuch as the acute form represents a separate and distinct type, whose direct relationship to the chronic forms remains, as Jaddasohn states, one of the most difficult questions with which dermatology has yet to deal, this paper will be devoted purely to the consideration of the chronic forms. Jaddasohn describes the average case of chronic type as follows:

Lupus erythematosus usually begins as a small light red non-infiltrated macule, with little or no elevation, desquamating early, and presenting after a longer or shorter period of time a differential shading of center and border. The center fades, becomes somewhat depressed, and takes on a whitish, brownish or purplish red discoloration. Its surface becomes smoother, and covered with a scale, whose under surface may contain plugs, which conform to depressions on the surface from which it has been removed. This lesion enlarges slowly and equally in all directions; the center and border differentiate themselves more sharply; after a period of time the lesion assumes a round, flat character, lupus erythematosus discoides, with a faintly depressed flat center, and a more or less broad, sharply circumscribed light or bluish-red border. This border is slightly elevated and perceptibly though superficially infiltrated. The surface is either smooth, or the follicular orifices are the seat of larger or smaller depressions, and are filled with whitish, sometimes blackish masses, which in the most typical cases resemble commedones. Sometimes the border is covered with a dry whitish, or a greasy yellow-

3. Arch. f. Dermat., 1872, p. 36.

Fig. 1.—Case 1: Lupus erythematosus of unusually severe type involving the entire right portion of the face, right eye, forehead, nose and a portion of the left cheek, taken at time when patient first presented himself.

Fig. 2.—Case 1: Taken three months after favorable treatment. Central areas for the most part healed; border actively spreading at all points.

Fig. 3.—Case 1: Taken two months after treatment with iodin locally and quinin internally, after the method of Hollander, showing unfavorable effects of this treatment. Central area much inflamed, eyelids edematous, congested and everted.

Fig. 4.—Case 1: Taken a year and a half after the Hollander treatment; patient blind and presenting horrible disfigurement.

ish or greenish mass of scales, whose under surface is covered with the same characteristic plugs. Pressure with a small, dull instrument produces an impression, and is evidence of an associated localized edema; sometimes the epidermis ruptures to slight pressure, as in lupus vulgaris, and free hemorrhage results. These variations form a series from the most superficial changes with light red discoloration, to the deep infiltrated nodular forms; with desquamation of the mildest type to thick crust formation; with light red to deep blue, and brownish-red discoloration; with faint atrophy to deep scar-like contractures; with telangiectasis of the finest capillaries to vessels of considerable size; with follicular orifices filled with a faint whitish plug; to comedo-like masses. And all these variations may be combined in a single case temporarily, or exist singly for a longer, or shorter, or sometimes an indefinite period of time.

CLINICAL REPORT.

With this brief review I wish to present for clinical consideration two cases of unusually severe nature of almost intractable character, with complications on the part of the conjunctival mucous membranes.[4]

CLINICAL REPORT.

CASE 1.—*History.*—Mr. C. P., watchmaker, aged 66 years, married, presented himself for examination March 22, 1904. He was born in Switzerland, served in the army and field, has always been robust and well; his family history was excellent. He came to America and married in this country at an early age, and had never had any venereal disease; his wife, aged 64, is robust and well, and the only children born to them, two

4. Although the direct transgression of lupus erythematosus from cutaneous surface to mucous membranes has been clinically observed for many years, but little attention has been directed to this phase of the affection until recent years. The mucous membranes most commonly involved are those of the lips, cheeks and palate, and more rarely of the gums, tongue, nose, tonsils, pharynx, larynx and uvula. In a review of some of these cases Jaddasohn justly states that correctness of the diagnosis in many is open to serious question. Involvement of the conjunctival mucous membrane is exceedingly rare, the literature revealing but a single instance, a case of Lustgarten's (*Jour. Cut. Dis.*, 1897, p. 529), occurring in a 20-year-old Russian, of 12 years' duration, involving cheeks, scalp, lips and conjunctiva of the lower eyelids. This case was presented to the New York Dermatologic Society, May 25, 1897, and the peculiarity of the cicatrices led Klotz to remark that the case bore a deceptive resemblance to lupus vulgaris. Lustgarten describes the lesion of the eye as a conjunctivitis, which Jaddasohn believes could have been a mere coincident, as in the case of hypopyon, and inflammation of the lids observed in Abraham's case of lupus erythematosus involving the hand and face.

married daughters, were in excellent health. His present ailment dates back eight to nine year, and began on the chin and nose in the form of two small red patches, and spread thence perceptibly to the left and right cheeks.

Examination.—Physical examination and inspection showed the patient to be in excellent health, and bearing no evidence of any associated or previous form of ailment. The entire right cheek, nose, chin, and a broad area entirely encircling the right eye, extending well over the lower half of the right forehead, was the seat of an active area of inflammation, with a sharp, circumscribed, well defined, slightly but superficially infiltrated, border, somewhat elevated above the surrounding normal skin and the fading central portion of the lesion (Fig. 1). The slightly elevated border sloped gradually towards the fading center, which in areas was smooth, white, glistening in appearance, and free from hair, scales and inflammatory products. The remainder was covered with adherent scales, whose under surface on removal was studded with numerous slender, sharp-pointed plugs, with a distribution corresponding to their insertion into the patulous orifices of ducts and hair follicles. The border was covered with yellowish-red and grayish-black greasy concretions soft and edematous to pressure, somewhat painful and prone to hemorrhage on removal. The inflamed area was studded with many comedo-like bodies. The left cheek was the seat of a smooth depressed atrophic-looking cicatrix, evidence of former activity and presenting signs of recurring activity in the form of a small, circumscribed, freshly inflamed areas. The hair of the mustache and beard had almost entirely disappeared with the exception of a small tuft on the chin. The mucous membrane of the upper and lower lip, and the orifice of the nose was involved by the direct extension of the process and was reddened and inflamed, granular in appearance, and covered with bran-like scales. The mucous membrane of the right eye was congested in color, irregularly eroded, granular and edematous in appearance and markedly ectropic. Both upper and lower lids of this eye and the lower lid of the left eye were the seats of active lesions. The eyelashes had entirely disappeared from the right eye and nearly all the hairs from the right eyebrow.

Treatment.—From March 22 to June 11, 1904, patient was subjected to the Roentgen ray exposures, supplemented with topical applications of the following formula:

R.	gm.	
Resorcin	10|0	3iii
Gum tragacanth	2|0	grs. xxxv
Glycerin	5|0	fl. 3iss
Distilled water	100|0	fl. 3iv

Fig. 5.—Case 2: Lupus erythematosus of same type as Case 1; taken when a portion of the actively spreading border has been surgically removed.—Right eye involved as in Case 1.

Fig. 6.—Case 2: Showing active border entirely removed by surgical extirpation, with cicatrized center; patient well.

During this brief period of time showed the greatest degree of improvement ever manifested. The central area became smooth, paler in color, and all evidence of active inflammation disappeared save from the border, and a few small circumscribed points, over the chin, lips and eyelids. The inflamed, infiltrated border became greatly narrowed, less inflamed, infiltrated, elevated and crust covered. The patient felt greatly relieved and less annoyed with the previous intolerable itching and burning, except for increased irritation on the parts of the eyes. The border, however, steadily advanced in circumference, and transgressed to the upper eyelid of the left eye, and well beyond that of the right eye to the border of the scalp (Fig. 2). This treatment was continued without material change with the same degree of improvement until Oct. 25, 1904, when iodin was applied locally and quinin administered internally after the method of Hollander,[5] reported at the time to possess almost specific properties. This iodin-quinin treatment was promptly followed by an intense and painful reaction, first manifested by an increased redness, and painful swelling of the inflamed borders, the small patch on the chin, and the muco-cutaneous border of the nasal orifices, accompanied with pronounced itching, burning and pain (Fig. 3). This treatment was continued in spite of its increased unpleasant effects until November 16, when the extreme discomfort of the patient, the increased inflamed condition of the border, and an inflammatory reaction on the part of the cicatrized areas, discouraged further therapeutic attempts in this special direction. Immediately following the suspension of this treatment two-thirds of the area originally involved became intensely inflamed, in spite of the free use of antiphlogistic remedies in the form of lotions, ointments and cold compresses, and covered with scales, crusts and studded with painful fissures and small abscesses. Severe conjunctivitis of both eyes, and an iritis of the right eye were added to the list of unpleasant complications (Fig. 4). This inflammation improved slowly under prolonged treatment, but the condition never regained the former degree of improvement attained by the use of the *x*-ray with local applications of resorcin. Other measures which were subsequently more or less unsuccessfully employed were Lassar paste, mercurial plaster, high frequency, ethyl chlorid, and the ultra-violet rays from a mercury quartz lamp. The eyelids of each eye were edematous, ectropic and eroded with granular ulcerations for

5. Monatschr. f. Prak. Dermat., xxxv, p. 105; Dermat. Ztschr., 1901, p. 42.

more than a year after they became primarily involved. Later they became cicatricially contracted, and the eyes inflamed from prolonged exposure and irritation. Blindness occurred in the right in 1905, and in the left eye in October, 1906. Blindness and weakness following the prolonged irritation to which the patient has been subjected, have confined him to his bed since October, 1906. March 17, 1907, the disease was still active, chiefly at the ever-spreading border, which had advanced behind the right ear, an inch or more into the scalp, and to the middle of the neck. The intervening area was atrophic and cicatrized, covered with loosely adherent scales, and the nose and ears pinched and distorted by irregular cicatricial contraction, and studded with small patches of relapsing inflammation. Nodules have always been absent, and patient has never responded to a tuberculin reaction.

CASE 2.—*History.*—H. D., aged 38 years, carriage designer, presented himself March 2, 1907. Two years prior to the date of his first visit patient noted a small red patch on the right cheek, below the eye. It soon became covered with yellowish scales and soft greasy crusts, and steadily increased in size with a fading center and with increased inflammation at the borders, in spite of painstaking attention on the part of the patient and his physicians.

Examination.—On the date of the first examination the patient presented a striking similarity to that originally presented by Case 1. The entire right cheek was the seat of a smooth depressed cicatricial-like atrophy, surrounded by a slightly elevated, infiltrated, inflamed border, involving the lower eyelid, the inner and outer canthus of the right eye, and it extended in an irregular circle over the cheek, upper lip, to the right ala of the nose; the other end of the imperfectly closed circle extended from the inner canthus of the right eye to the bridge and for a short distance over the crest of the nose. The mucous membrane of the upper lip and lower eyelid were reddened, edematous, and studded with granular ulcerations. Numerous comedo-like bodies studded merely that portion of the bridge and crest of the nose which was the site of the inflamed and actively spreading border. The receding edges of the rest of the border was the seat of numerous loosely adherent scales, which on removal were covered on their under surface with numerous characteristic plugs. The border was covered with yellowish and greenish crusts, irregularly fissured by numerous crevices, and rather firmly adherent to the underlying soft mushy edematous tissue. Patient experienced

Fig. 7.—Early stage of lupus erythematosus, showing hypertrophy of the sebaceous glands (S), of the sweat glands (G), and hair follicle surrounded by a mild degree of reactionary infiltration (I).

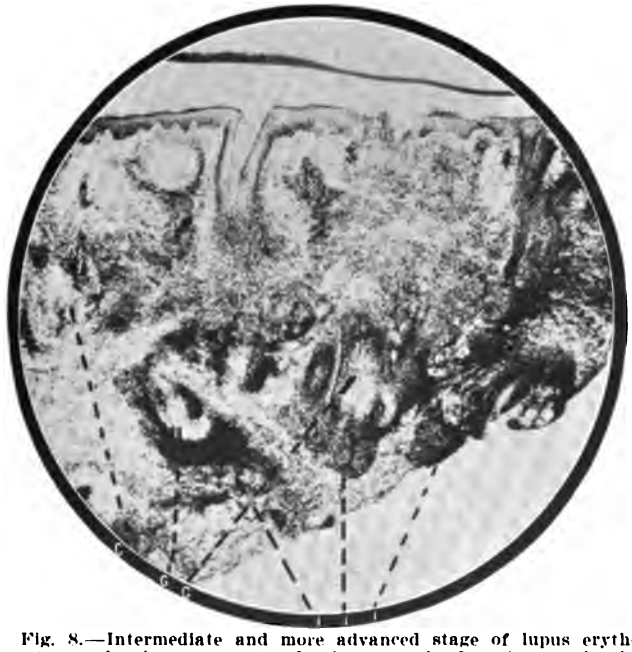

Fig. 8.—Intermediate and more advanced stage of lupus erythematosus showing remnants of sebaceous glands (G), previously hypertrophied and completely enveloped and almost entirely destroyed from pressure infiltration of the inflammatory exudate (I).

Fig. 9.—Sebaceous gland (G), hypertrophied and enveloped with a mass of inflammatory exudate (I). Intermediate magnification.

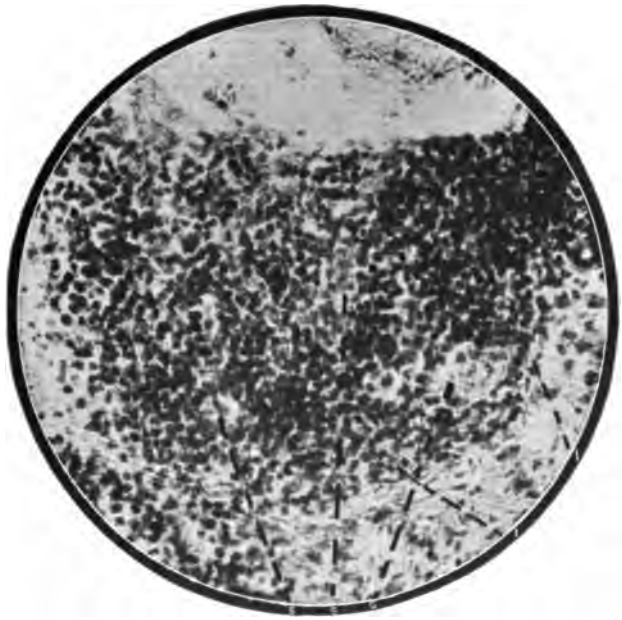

Fig. 10.—Remnants of previously hypertrophied sebaceous gland (S) (G) completely enveloped and almost entirely destroyed by inflammatory exudate (I) : under high power.

no symptoms with exception of occasional itching, most marked over the lower eyelid of the right eye. The case bore a striking resemblance to Case 1 and showed a similar degree of activity, inflammation and distribution.

Treatment.—Inasmuch as it gave every indication of ultimately inducing the same degree of involvement, and producing the same unfortunate sequelæ, prompt, active and stern measures were deemed necessary to cope with the situation. In view of the fact that all signs of active inflammation had disappeared from the center, measures were directed chiefly to the inflamed and actively spreading border. March 3 about one-sixth of the spreading border on the outer lower aspect of the cheek was freely excised and the edges carefully sutured with silkworm gut and horsehair. Union by primary intention was promptly obtained. On March 15 a second similar area was likewise excised with similar results. The friable character of the inflamed tissue, which had the consistence of moist brown paper, offered the only difficulty to these operations, and rendered its careful extirpation irksome and tedious. The extirpation of the border seemed to arrest effectually the progress of the disease at these points. March 21 the spreading border at the inner canthus of the right eye, and over the right half of the bridge of the nose was excised in order to arrest promptly the spread of the disease to the left eye; this proved to be a very irksome and tedious procedure, because of the tension from the wide area removed, and the soft mushy character of the surrounding tissues, the free edges could not be well approximated, and a large area was left to close by granulation, which was successfully accomplished in 14 days' time. A fourth area, involving the upper lip, was surgically removed March 25, and by April 18 the disease seemed effectually arrested at all points save over the eyelids and near the external angle of the right eye. At these points the disease had steadily progressed, the border had become heavier and broader, and had advanced from the lower to the upper eyelid. Although the case bore no clinical or pathologic resemblance to lupus or tuberculosis, 10 minims of 1 to 1,000 sol. tuberculin was given as a test injection March 10 with negative results.

CASE 3.—*History.*—B. C., aged 27, lumber agent, was selected for clinical and pathologic study as a moderate type of lupus erythematosus discoides with a non-fading center, of relatively short duration. The lesion on the occasion of patient's first visit, March 10, 1907, was elliptical in outline, situated near the center of the right cheek and covering an area

about the size of a silver dollar. The center of the lesion was well covered with a mass of greenish-brown and grayish-white scales, elevated slightly above the level of the surrounding skin, and studded here and there with comedo-like points. The scales on removal showed characteristic plugs on their under surface, and the corresponding follicles of the skin were widely patulous. The border was slightly inflamed, well defined and actively spreading. The duration of the process was scarcely six months.

Treatment.—Ethyl chlorid and a lotion containing potassium sulphuret and zinc sulphate were first applied without apparent benefit, and on March 20 the posterior third, and on April 4 the anterior third were freely excised; both operations were followed by union by primary intention and with marked improvement; by April 20 the intervening third alone showed activity, and in attenuated form.

CASES 4, 5, and 6.—These were selected as well defined types of moderately severe lupus erythematosus, with fading and partially cicatrized centers; Case 4, a female, aged 37, with three lesions around the mouth of four years' duration, following an attack of herpes labialis; Case 5, a female, aged 41, with lesions of twelve years' duration, having a characteristic bat-wing distribution over nose and cheeks; and Case 6, a male, aged 38, with a lesion of six years' duration the size of a silver dollar over the left cheek. Small areas were extirpated in each of these cases, usually from the actively spreading border, merely for pathologic study, the distribution and involvement precluding a radical extirpation of the diseased area. The patients were variously treated for periods of six months to two years, with the *x*-ray, ultra-violet light, pyrogalic pastes and solutions, ethyl chlorid spray, resorcin, salicylic acid, green soap, mercurial plaster, etc., with moderate improvement, and with indifferent and varied results.

THERAPY.

Lupus erythematosus possesses, in all probability, the most complex therapy of all dermatologic affections, and therefore like all affections which possess a host of remedies there is probably not a single measure of specific character or of unfailing efficacy among the number. It would be insuperable and useless to enumerate all the measures thus far tried and recommended. They comprise all forms of internal, external, local and general measures in the form of alteratives, tonics, eliminants,

Fig. 11.—Hypertrophied sweat gland (G) showing marked endothelial proliferation and inflammatory cellular invasion. Connective tissue (C). Intermediate magnification.

Fig. 12.—Muciparous gland (G), showing endothelial proliferation, surrounded with cellular exudate (I). Intermediate magnification.

Fig. 13.—Showing extensive down- and over-growth of epithelium (Eh) as a result of the abnormal stimulus on this tissue; simulating epithelioma. Inflammatory infiltrate (I). Cavity (C) site of a dislodged plug.

regulation of diet, changes of scene, altitude, climate and almost every physical and chemical therapeutic agency, in single and combined form, known to dermatologic science. My personal experience leads me to believe that many of the measures recommended possess some favorable therapeutic influence in limited measure and in favorably selected cases.

The acute disseminated types, with sudden onset, febrile disturbance, general malaise, intolerable itching and burning, offer probably the greatest difficulties to successful management during the incipiency and earlier stages of the affection, yield more favorably to bland palliative measures, and end usually in complete recovery in relatively short time. The next more favorable class for treatment are the more chronic, circumscribed types of lupus discoides, characterized by a milder incipiency, with a faintly active and mildly spreading border and fading center. This is the class in which good results are often secured from the host of favorably recommended remedies. These forms often undergo spontaneous recovery; but recurrences with and without treatment are not uncommon.

The least favorable classes are the chronic discoid forms, which show a crust-covered, scaly, inflamed, nonfading center, or a border that is edematous infiltrated, elevated above the level of the surrounding epidermis, which continues to advance steadily and involve adjacent structure and tissues, uninfluenced to any appreciable degree by repressive measures. These are the forms in which the total of all measures have thus far availed little, and have effectually depressed our drooping hopes in what little success has thus far attended every new measures in selected cases.

The futile character of the therapy in special cases and the apparent local nature of the process, impelled me to resort to surgical extirpation, in order to arrest effectually its progress and to spare the surrounding tissues and avoid the serious complications incurred in

past experience. This treatment appealed to me as rational and expedient, and was undertaken without the knowledge that Rosenthal,[6] as early as 1892, and B. Merrill Ricketts,[7] independent of Rosenthal in 1893, carried out similar measures, which in more recent times have been advocated by Leredde,[8] Hallopeau and Neisser. In cases in which the lesions present a fading center, in other words, where the duration of the process is self-limited, the removal of the ever actively spreading border seemed alone required. Removal of the border from lesions with active centers does not suffice to arrest the further progress of the disease; these lesions, when sufficiently severe in nature and favorably situated, should be removed in their entirety, if not at one fell stroke, at least by successive steps. My personal experience does not permit me to judge the value of curettement, or the superficial removal of affected area by means of a razor after the method of Ehrmann.

ETIOLOGY.

The etiology of lupus erythematosus in the absence of the discovery of a specific cause, is still a problem for further solution. Opinion is fairly well divided as to whether it possesses a direct or indirect etiologic relationship to the toxemias from tuberculosis, gastrointestinal disturbances, or, in spite of the apparent non-contagious character, it is an infectious disease *per se*, and entirely independent of the former, save for their possible predisposing influences.

I concur with Jadassohn that, in spite of the absence of positive bacteriologic proof, the burden of evidence is in behalf of its infectious nature and external and local character. The character of the lesions, the sharply defined, inflamed spreading borders, the fading centers, their tendency to relapse and multiply, to yield to local measures and surgical intervention, to follow on the

6. Dermat. Ztschr., ix.
7. Trans. Pan.-Amer. Con., 1893, ii, and N. Y. Med. Jour., 1893, lx, 23.
8. Ann. de Dermat., 1898, p. 262; 1901, p. 548.

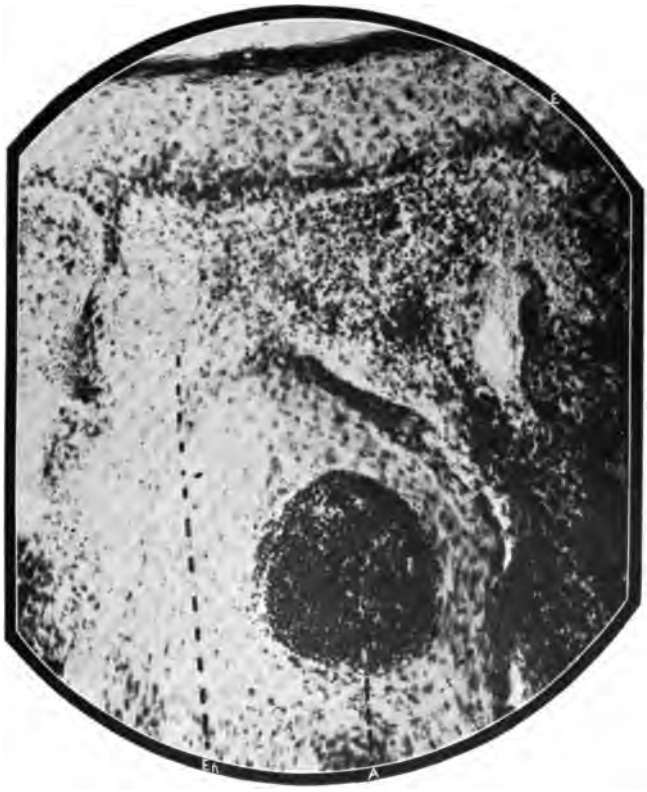

Fig. 14.—Showing down- and over-growth of epithelium (Eh) and containing a dermal abscess (A) simulating blastomycosis.

Fig. 15.—Lupus erythematosus, showing epithelial overgrowth (Eh), surrounded with inflammatory infiltrate (I) and containing a nest (N) simulating epithelioma.

heels of slight injuries and abrasions (herpes labialis, furunculosis, burns, etc.), these and many other features speak strongly for its local and infectious nature and external source.

PATHOLOGY.

The pathology of lupus erythematosus in the absence of a special recognized cause and in the presence of a large number of incongruous investigations, forms an interesting study. Unna[9] states that "we can look in vain for a characteristic histologic entity which reflects the clinical characteristics of the affection." The reports (for the most part they are the earlier and later, in point of time) are chiefly at variance with each other in regard to the location of the primary pathologic disturbance; the former impart to the pathology an epidermal character in line with its clinical manifestations; the latter would make a form of granuloma with a distinct focal character emanating from the blood vessels of the corium and give secondary consideration and importance to the associated changes in the epidermis and adjoining tissues. Any obscurity in the pathology of the affection rests chiefly on this dual interpretation, for in other respects, except in some minor details, the findings are uniformly constant and characteristic. The disparity which at present exists in the reports of various investigators depends, I believe, not as Stelwagon[10] states, to the stage and character of activity of the various lesions in question, but to the opposed situation of these viewpoints.

The earliest recognizable changes are in the adnexa of the epidermis, the hair follicles, sebaceous and sudoriferous glands, when these are present, otherwise in the epidermis proper, as can be readily determined by the histologic examination of the spreading border of an active lesion, to its point of gradual transition into nor-

9. Histopathol., p. 1090 and 1097; Monatschr. f. Prak. Dermat., 1890, II, 134.
10. Med. News, 1893; Text-Book, 1903, p. 712.

mal tissue. Holder[11] states that "so predominant are the changes in the seborrheal glands in the early lesion that it is not surprising that the older observers look on them as the probable starting point of the disease. Had it not been for the fact that the lesion appear l on the palms where sebaceous glands are absent (these views) might have remained unmodified. . . . Kaposi's theory embraced sweat glands as well."

The hair follicles show active mitotic changes, the orifices are filled and distended with keratotic material and form early histologic evidence of the characteristic plugs of later clinical stages. The stimulus promptly exerts its hypertrophic influence on the hair follicle and its sebaceous glands, which increase in circumference and depth. It is not uncommon to observe masses of sebaceous glands hypertrophied to and beyond the layer of coil glands. The latter show endothelial proliferation, cystic dilatation and keratotic plugging of their orifices.

The next step in the pathologic change is a reaction on the part of the tissues, in the form of a plasma cell exudation, which issues for the most part from the immediate vessels of the corium, grouped and collected in character and directed against the abnormal follicles, sebaceous and sudoriferous glands. This circumscribed exudation of small round mononuclear, deeply stained, closely crowded cells, irregularly distributed in groups, immediately arrests the attention of the observer and gives the affection its most characteristic pathologic features. It is almost distinctive of the affection, and for these reasons it has probably been given primary rather than secondary importance. These cells, though undergoing occasional individual degenerative changes, preserve for a long time their original character, and do not show the ordinary cellular changes which are currently observed in tuberculosis, syphilis and simple inflammation. In the next stage of the process the cells begin to crowd closely around the glandular elements,

11. Jour. Cutan. Dis., 1897, p. 207.

Fig. 16.—Taken from an area free from hair follicles and glandular elements. Stimulus is directed chiefly to the epidermis (E) inducing its down- and over-growth (Eh) and calling forth inflammatory exudate (I) merely in the immediate locality.

Fig. 17.—Sweat duct (D), containing an epithelial plug (P), simulating porokeratosis.

completely envelop them, and gradually effect their disintegration and destruction.

In the more moderate cases the disease expends its energy on the glandular elements, and the process then resolves itself by simple inflammatory change. In the more severe types, in the active relapses over cicatrized areas, surfaces of mucous membrane and over areas which are devoid or poor in glandular elements, the affection expends its energy on the epidermis. The earliest changes show active mitoses in the lower layers of the rete and an active acanthosis. A commensurate plasma exudation follows from the superficial layers of the corium, which directs itself against the proliferating epidermis, which often shows extensive down-growth between the elongated papillæ in finger-like masses, with its cells arranged in nests and whirls, closely simulating an epithelioma. The plasma cells crowd in dense masses to the very tips of the papillæ, and these when cut obliquely give them the appearance of epidermal abscesses.

Both the pathologic and clinical resemblance of these well-defined cases of lupus erythematosus to some of the cases of blastomycetic dermatitis reported in the literature, is striking, and the analogy is more complete from the fact that they frequently contain well-defined, double-contoured bodies. These large double-contoured bodies are frequently observed in the plasma exudate of lupus erythematosus (Neumann,[12] Veiel, Morrison[13] and others). Unna states that "rarely one finds a cell which exceeds in circumference the plasma cells, but with vacuolated (bläschen-formig) nuclei. A moderate polymorphous leucocytic invasion occurs among rete-cells and their interstices.

The remaining pathologic changes noted were chiefly of a secondary nature and are for the most in accord with the findings of other investigators. The elastic

12. Wien. klin. Wochschr., 1898, lxviii, 1137.
13. Arch. f. Dermat. u. Syph., 1886, p. 619.

fibers are as normally preserved and as abundantly present as the general character of the inflammatory changes would permit an approximate estimate. Some slight change can be noted in some of the fibrils distributed to papillary portion of the corium, but, unlike Schoonheid,[14] I am unable to attach any special significance to such a feature. Dilated capillaries and lymph spaces, and occasional endarteritis was frequently observed, but not more than could be currently expected in chronic inflammation of equally severe and prolonged type.

The prolonged congested and edematous character of the lesions and their exceedingly friable nature readily accounted for the numerous thin-walled capillaries and spaces, which were congested with red corpuscles, in various stages of preservation in the superficial layers of the corium, and also probably accounted for some of the irregular spaces, cavities and artefacts (canalization of Unna), which were also observed. No thrombi were observed in any vessels of the corium, as observed by Fordyce and Holder,[15] and nothing was noted which could in any way lead me to infer that the vessels of the corium were the seat of the first pathologic change.

Diffused hemorrhages in various stages of preservation were frequently observed in the upper layers of the corium, and many thin-walled capillaries gorged with one or more columns of well-preserved red corpuscles. The orifices of hair follicles and sudoriferous glands were almost invariably the seat of an extensive endothelial proliferation which filled their cavities to a considerable depth with dense keratinized plugs, or when accidentally or mechanically removed left them widely patulous and imparted a honey-comb appearance to the stratum corneum. The plugging of the sweat ducts was not altogether unlike that observed in porokeratosis. In some of the more severe cases of rather long duration,

14. Arch. f. Dermat. u. Syph., liv, 163.
15. Med. Record, 1900, p. 41.

Fig. 18.—Showing proliferating hair follicle (H) surrounded with inflammatory exudate (I) and containing numerous cavities (C), the former sites of dislodged plugs.

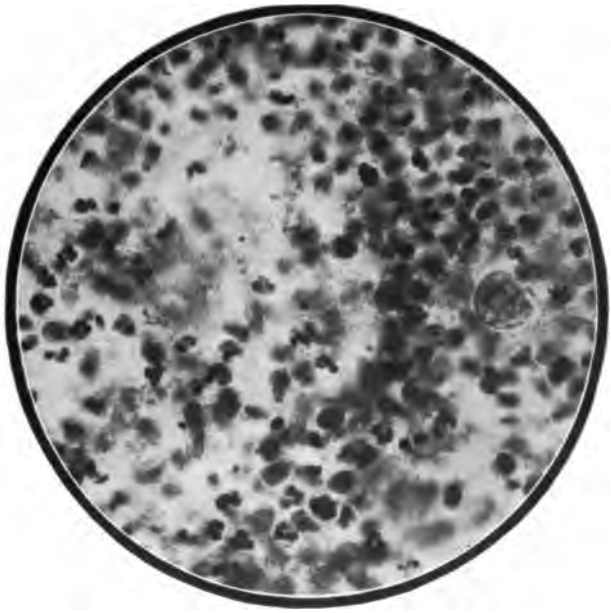

Fig. 19.—Characteristic cellular exudate of lupus erythematosus of deeply stained mononuclear cells containing a large double contoured body simulating blastomycosis.

well-defined giant cells were occasionally observed among the plasma exudate,[16] which in themselves do not differentiate the affection from lupus and syphilis, as frequently stated. The pathologic differentiation of the affection from syphilis and lupus is facile without this distinction. My personal efforts to establish a specific cause by bacterial investigation were attended by uniformly negative results.

SUMMARY.

1. Lupus erythematosus, in the absence of bacteriologic proof, appears to be a local infectious diseases.

2. The course of the disease varies with the special clinical types, and the severe forms do not yield readily to the present complex and inadequate therapeutic measures. The severe types, when favorably situated and sufficiently well circumscribed, should be extirpated; merely the border if the center is undergoing visible signs of retrogression and cicatricial atrophy, otherwise the entire lesion.

3. The conjunctival mucous membrane may become involved by direct extension of the process, and in severe cases blindness may become a complication. The primary pathologic focus appears to be in the epidermis and its adnexa, rather than in the vessels of the corium. The earliest changes are observed in the hair follicles and sebaceous glands when they are present, in the form of an active proliferation of the cellular structure.

4. These in turn call forth a focal exudation of plasma cells from the immediate capillaries, which imparts to the affection a characteristic pathology, and is often accorded primary rather than secondary importance. The sweat glands share in the same process. The process is accompanied with free superficial keratinization and plugging of the orifices. In the absence of hair follicles

16. Hyde and Montgomery (Text-Book 1904, p. 687) state that there are no giant cells in lupus erythematosus as in lupus. Schoonheid (Arch. f. Derm. u. Syph., liv, p. 16) states that "Riesenzellen waren niemals vorhanden."

BLASTOMYCOSIS IN AN INFANT.

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This is a peculiar disease, from a geographic standpoint. Its home so far seems to be confined to America, and only in a few localities, largely in the Mississippi valley, if we also include the city of Chicago. The forms on the Pacific coast seem to differ from those found in other localities in the United States and are named protozoic and coccidioidal.

In cases of protozoan infection the organism develops by endogenous spore formation and not by budding, while in blastomycosis the only way of development in the tissue is by budding. The cultures also differ somewhat from those obtained in blastomycosis.

The first case reported from Boston was in the latter part of 1906. There were no recognized cases in England up to 1903; a doubtful one was reported from Madrid the same year. I have seen three cases in the past eight years, one of them somewhat doubtful.

I am indebted to Dr. W. W. Jones for referring to me the patient who is the subject of this paper and for the previous history as well as the family history.

History.—E. J., when she was four to five months old, was brought for treatment of an eruption which had appeared on her head and cheeks a week or ten days previously. The lesions consisted of patches about the size of a silver dollar, the one on the left cheek was oblong in contour, those on the right cheek and scalp were more or less circular. The patches consisted of crusts which were raised and warty in appearance,

with red borders; there was a small amount of pus under the crusts and especially at the edges. In a few days other pinhead sized patches appeared around these, and formed crusts which gradually enlarged until, coalescing with the larger crusts, they formed large patches. An ointment was applied, which seemed to stop the extension of the lesions, but did not remove them. This treatment was continued for about three weeks. Then the little patient passed into the hands of a second physician, and later to a third. The disease had been named eczema, double eczema, etc. About three months later, Jan. 24, 1906, the baby was returned to the first physician and by him referred to me for a diagnosis and to recommend treatment.

Family History.—Mother of child had had two attacks of appendicitis, was of a nervous temperament, fairly well nourished, and had never had any skin lesions. The father had always enjoyed good health, and never had any skin disease. Father's mother had heart trouble. Aunts and uncles on both sides had been free from integumentary lesions.

Examination.—The child, aged eight months, white, female, weighed twenty pounds and seemed to be well nourished. I found a lesion on the right cheek (Fig. 1), two and one-half by three inches in area, on the left cheek (Fig. 2); one a little larger, which was inclined to be circular in outline; one large patch on the scalp (Fig. 3), extending from the anterior of the occiput nearly or quite to the frontal bone, in width about three and one-half inches, with small split-pea sized lesions scattered from the facial to the parietal lesions, and many small patches on the buttocks and hips, which were devoid of crusts or warty appearance, but retained the red border—probably due to the contact of urine and frequent bathing. The patches on the face were elevated from one-eighth to one-fourth of an inch above the surrounding skin, the surface was covered by papilliform elevations separated by small clefts of varying depths, giving them a warty or cauliflower appearance. The borders sloped more or less abruptly from the elevated roughened surface to the surrounding skin. In color the lesions were not as dark as are those usually encountered in older patients, but were set with as many small abscesses as are usually found, but the warty projections were more delicate and a small amount of pus could be made to exude on pressure. The subjective symptoms would naturally be few in one so young, she seemed to be well nourished and nursed with a relish. When she became too warm she would scratch her scalp, indicating that it itched slightly. Re-

Fig. 3.—Blastomycosis. E. J., at 8 months, showing scalp lesion.

Fig. 4.—Photomicrograph showing budding blastomycetes. Objective 1/6.

moving crusts, for culture and microscopic examination, caused the little one to cry out, indicating that the lesions were very sensitive to trauma; the base was very friable and vascular.

The clinical diagnosis was that the disease was probably blastomycosis. This was confirmed by microscopic examination.

Microscopic Examination.—An examination was first made of the dry scab covering considerable portions of the lesion proper, and it was found to consist principally of serum, dead epithelial cells and the powder which had been used for treatment. This dry scab was treated with a 5 per cent solution of potassium hydroxid, but none of the specific micro-organisms were discovered. On squeezing the tissue a purulent fluid escaped. Under the microscope this was found to consist principally of pus cells, broken down tissue elements and a few blastomycetes, with some bacteria, principally staphylococci. Next a piece of the proliferating newly formed tissue of the lesion proper was grasped with a forceps and excised with a sharp knife. A part of this was used for making a microscopic section, another part for the inoculation of culture media, and a third piece was macerated in a 5 per cent. solution of potassium hydroxid. After the cellular elements had become clarified by the caustic potash, it was found that the field of the microscope was filled with a large number of spherical organisms with a double wall and varying in diameter from 14 to 20 micra. Many presented small budding processes (Figs. 4 and 5); others grew in pairs, the protoplasm of both being continuous. In such cases one of the organisms evidently presented a rather mature bud. The organisms presented a rather refractile appearance because of the clearing of the protoplasm. Pieces of the diseased tissue were placed in tubes of glucose agar and blood serum, which were then placed in an incubator at a temperature of 37 C. After two days a growth was visible which on microscopic examination was found to consist principally of blastomycetes and a few staphylococci. These were then isolated by the use of the Petri dish method and pure cultures of each obtained. The staphylococcus presented its ordinary characteristics, and was no doubt present as a contaminating micro-organism. The cultures of the blastomycetes grew well both in the incubator and at body temperature. Those made on glucose agar grew much more rapidly than those on blood serum. There was considerable difference between the cultures when grown at incubator or ordinary room temperature. In the former they remained as rather small, distinct, grayish colored, moist colonies, which

on microscopic examination were found to consist principally of budding cells. On the glucose agar, however, they developed more rapidly, producing a dry, whitish woolly, elevated growth which spread over the entire surface of the medium, and which, on microscopic examination, was found to consist principally of hyphæ. The sections were imbedded in celloidin and cut 12 micra in thickness. The piece of tissue was found to consist almost entirely of epidermis, the cells of which had markedly proliferated. These consisted principally of a downward growth in the form of a wide irregular process. In many places, particularly in the deeper portions, a number of necrotic foci were found in a nest (Figs. 6 and 7) and projections of epithelial cells. These areas were filled principally with pus corpuscles and detritus of epithelial cells, and contained also a number of blastomycetic organisms.

Treatment.—Potassium iodid was recommended, as I did not think it prudent to use the Roentgen ray on one so young. There was besides, the difficulty of keeping the baby quiet when not asleep, as we found when the photographs were taken; those of the face and scalp were taken while she was asleep, the shoulder and buttocks were taken while she was awake and were destroyed. Preceding our examination it had been proposed by physicians that the child be weaned; why, I do not know, it being well nourished and stout for a babe of eight or nine months. I think it would have been a sad mistake, as we would have lost the indirect method of treatment. I took my cue from the beneficial effects of treating the mother, who has a child with hereditary lues. The mother and child both took potassium iodid. A wash of formalin 2 per cent. solution was first used, then an ointment containing salicylic acid and zinc oxid with a lanolin base. The scabs softened and came away, and at the end of three weeks there was marked improvement; at the expiration of eight weeks all the scabs had disappeared, leaving only slight scars on the cheek (Fig. 8), which promise to entirely disappear in time. During the time the child was taking treatment it seemed well and grew rapidly.

My reasons for reporting this case are the geographic peculiarities, the beneficial effects of potassium iodid in the direct and indirect treatment of blastomycosis, and, last but not least, the fact that this is the youngest patient (eight months old) of which I have any record with the limited literature at my command. I am greatly indebted to Dr. Albert for the microscopic findings.

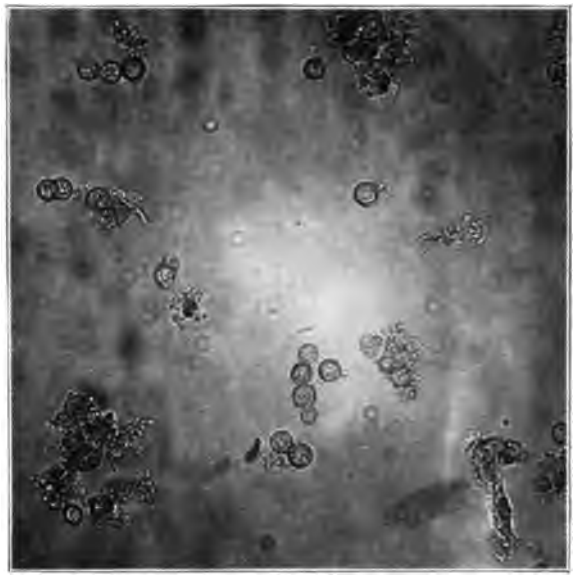

Fig. 5.—Photomicrograph showing organisms in pairs. Objective 1/6.

Fig. 6.—Photomicrograph of section through lesion showing areas of necrosis containing blastomycetes. Objective ⅔.

DISCUSSION.

DR. WILLIAM A. PUSEY, Chicago, said he thought the next youngest case was in a girl of 14 years, under his own care. He knew of no other infantile case reported. When Dr. Kessler first described the clinical appearances of his case, Dr. Pusey thought that perhaps the case was one of vegetating dermatitis from pus organisms, but the bacteriologic findings, he said, leave no doubt as to the diagnosis.

The case emphasizes that blastomycosis may affect one at any age; the cases now on record range from eight months to the senile stage of life. To physicians in Chicago and in the Mississippi Valley blastomycosis is an exceedingly important subject. It is no longer a clinical curiosity in Chicago, where there have been many cases, so that even the hospital internes are acquainted with it. To many it is a source of constant speculation to learn why blastomycosis is so prevalent in our part of the country, and he thought that we are entirely ignorant on that score. It is by no means a trivial disease merely affecting the skin. Not infrequently cases of systemic blastomycosis closely simulate systemic tuberculosis. Dr. Pusey called attention to the fact that from ordinary pus infection a histologic picture may result similar to that of blastomycosis. He recently removed a papillomatous mass from the corona glandis which gave a histologic picture practically identical with that of blastomycosis. There was a dense infiltration of the corium with round cells, among which there were many mast cells and plasma cells. There was great overgrowth of the rete with down growth of intercapillary pegs, and all through the rete were to be found intraepithelial abscesses. Except for the absence of giant cells, the picture was that of blastomycosis. A number of Chicago men, familiar with blastomycosis, agreed that the picture was that of blastomycosis. Nevertheless, a rather careful search of the specimen failed to show blastomycetes. It was not difficult to demonstrate the presence of staphylococci in the tissue. Cultures made from the miliary abscesses showed no blastomycetes, but pure cultures of *Staphylococcus albus*. The case, therefore, seems to be one which clinically and histologically is closely like blastomycosis and yet is a lesion produced by a common pus organism.

DR. HENRY C. BAUM, Syracuse, N. Y., gave a summary of a case which he showed at the meeting of the American Dermatological Association two or three years ago. A colleague developed a lesion on the back of the right hand which was recognized clinically as blastomycosis, but in which the microorganisms could not be found. About three months later a similar lesion developed on the right ala nasi and the adjacent cheek, and a third lesion behind the left ear. As the diagnosis was reasonably positive, he was promptly put on potassium iodid and exposed to the *x*-rays. For a long time—perhaps

six months—the treatment had no appreciable effect on the lesions, except that they did not extend. After many unsuccessful attempts, the organisms were finally found in each one of the lesions, and at the time the patient was presented, cultures were also shown, and the diagnosis was concurred in by all the members present. The case went on practically to recovery. First, the lesion on the cheek and nose disappeared, and then that on the scalp, and the hair, which had disappeared from that area, grew again. In all these patches there developed an atrophic and drawn appearance of the skin, and perhaps for a year later these patches remained soft and white and smooth. Dr. Baum thought the point of greatest interest in this case was the absolute inability to find the micro-organisms for a long time, in spite of repeated smears and cultures on various media and blood serum, although finally they were located in all the lesions. Another case that came under his observation was that of a girl 12 years old in whom the process had involved the dorsal aspect of the right calf. Another was in a woman 52 years old, with a lesion on the back of the right hand. In both of these cases there was no difficulty in finding the organism from the start. In this last case no iodin preparation was given nor were the *x*-rays used, the treatment being limited to the application of an indifferent ointment and the use of the high-frequency current from the vacuum tube. The process healed very nicely, and in less time than did that in the first case, and in any future cases that come under his observation he is inclined to try the high-frequency current before resorting to the *x*-ray.

Dr. W. T. Corlett, Cleveland, Ohio, said that the only case thought to be blastomycosis he had seen in Cleveland was not confirmed by the culture and microscopic findings after repeated trials. At one time it was thought that the characteristic budding yeast fungus had been found, but it proved to be due to the starch dressing employed. The patient has since died. The patient was shown at the meeting of the American Dermatological Association in 1906, when some doubt was expressed as to its nature.

Dr. John A. Fordyce, New York City, called attention to Dr. Pusey's remark that pyogenic organisms may produce lesions similar to blastomycosis. Two years ago, at a meeting of the American Dermatological Association, Dr. Fordyce showed some photographs which presented the clinical picture of blastomycosis, but the organisms could not be found in the lesions. There was some epithelial proliferation and cell infiltration, but the characteristic micro-organism was absent. He emphasized that giants cells are found in blastomycosis, but not in pyogenic lesions.

Dr. Jay F. Schamberg, Philadelphia, reported an error of diagnosis in regard to a supposed case of blastomycosis cutis. The patient was a man with an extensive papilllary ulcerat-

Fig. 7.—Same as Fig. 6 under 1/6 objective.

Fig. 8.—Blastomycosis. E. J., at 11¾ months, showing cicatrices on cheeks.

ing growth on the back of the hand. Sections of this were made and cultures taken from the pus which gave a rich growth of yeast fungus. The microscope failed to reveal the yeast fungus, but gave a general picture not unlike that of blastomycosis. On account of the histologic picture and the cultural findings a diagnosis of blastomycosis was made and the patient was treated on that basis. He subsequently grew worse, and further microscopic examination positively demonstrated that the case was one of carcinoma. An amputation of the hand was done, and carcinoma subsequently developed in the axilla, necessitating amputation of the arm and ultimately terminating in death. He felt sure that the presence of the yeast fungus was due to contamination from the air. Care is therefore necessary in diagnosis without confirmation by both histologic and cultural studies carefully pursued.

DR. M. B. HARTZELL, Philadelphia, remarked that the discussion shows that the diagnosis of blastomycosis cutis may be at times extremely difficult, and can only be definitely settled by microscopic examination. Dr. Hartzell recalled a case, which he saw about 18 months ago, in which there was a papillomatous lesion on the back of the hand which closely resembled blastomycosis. Sections and cultures from this lesion were entirely negative, and it healed spontaneously within six weeks, yet clinically it was a perfect picture of blastomycosis. Without finding the organisms of blastomycosis one is not justified in making that diagnosis.

DR. J. B. KESSLER, Iowa City, Iowa, agreed regarding the difficulties of diagnosis in some cases. When the case he reported first came under his observation, his son, Dr. J. C. Kessler, and he narrowed the diagnosis down to two affections, namely, mycosis fungoides and blastomycosis cutis. They had recently had a case of mycosis fungoides, and with the microscope they were able to establish that this case did not belong to that category, but was one of blastomycosis. Whether or not the local treatment had any beneficial effect in this case he was unable to say. Potassium iodid was administered to the mother with the idea that it might indirectly benefit the child.

TWO SEBORRHEIDS OF THE FACE.

I. ACNE RUBRA SEBORRHEICA. II. PITYRIASIFORM SEBORRHEID OF THE FACE.

M. F. ENGMAN, M.D., AND W. H. MOOK, M.D.
ST. LOUIS.

ACNE RUBRA SEBORRHEICA.

At the third International Congress of Dermatology and Syphilography, Petrini described two cases of a disease of the skin of the face in middle-aged women, which appeared in the form of small red papules, especially about the nose. He recognized from the color and clinical features of this affection that it was a distinct and characteristic condition. To this affection he applied the term acne rubra seborrheica. In 1903 Pringle undoubtedly described the same condition in an article[1] to which he gave the title, "A Rare Seborrheid of the Face." Since that time we have carefully watched the literature for further contributions on this condition, but after a rather thorough search no further data could be obtained. One of us had for years been in the habit of classing the affection above named under the term "seborrheic acne."

It seems strange that more attention has not been called to this not infrequent condition, as it is distinct and not easily confused with any other of the skin. On close examination one can readily see that it has not the appearance of an acne vulgaris or simplex, and its therapeutic handling renders it in itself distinct from those affections. Pringle reports only one case, and

1. British Jour. of Dermatol., February, 1903.

mentions several others in his contribution, but seems to have confused its etiologic features.

Acne rubra seborrheica, as the title indicates, always occurs in seborrheic individuals, and when we speak of seborrhea we mean the seborrhea oleosa of the older writers, characterized by oiliness of the skin, especially through the center of the face, thickening of the skin in many instances, more or less dilatation of the follicles, and possibly here and there some small scaly patches; and, there may be associated with this seborrheic groundwork a few comedones with their subsequent acne. Acne rubra seborrheica is, therefore, a disease which may occur any time after puberty.

The disease begins as a small, follicular papule of a rose-red tint, varying in size from a pin point to a lesion as large as a split pea. The lesion is more or less convex, sometimes capped by a small scale, which is closely adherent, and in the very earliest stage in the formation of this scale there may be seen a minute pustule, which quickly dries into a crust. As evolution progresses the desiccation extends from the summit to the base of the papule. The papule gradually flattens and remains in this desiccating condition for some time. Several of these lesions may coalesce to form small patches, but this is, in our opinion, unusual, as one of the distinct characteristics of the disease is the disseminated distribution of the eruption.

Here and there is sometimes slight grouping, but it is not a conspicuous feature. In the majority of cases these lesions are irregularly scattered about the base of the nose, near the naso-labial furrow, about the chin and on the forehead. The nose itself is not so frequently affected as its immediate neighborhood. Where the disease has existed for a long period it is widely scattered over the face and neck. As yet we have seen no lesions of this type on the chest or shoulders. On account of the rose-red color of the lesions, when taken in their ensemble, and when closely placed together, they

give the appearance of flushing, almost of a rosaceous condition. Especially is this true when the patient enters a warm room or blushes, and it is a fact that in all of these cases, without a single exception, a blush is easily caused, rendering the lesions, therefore, more congested and conspicuous.

The disease, without proper treatment, does not undergo involution, as some of our cases have existed ten and twenty years, and have been treated in many instances, possibly, for acne vulgaris. Although the condition does not as a whole undergo involution, yet here and there, where it has existed for long periods, sites of former lesions are easily recognized by a slight pigmentation, and when the face becomes congested by blushing or exertion these foci are easily discernible.

Not infrequently there is a complication of some other seborrheid. Petrini refers to a probable seborrheic condition of the lips and mucous membrane in one of his cases. Seborrheic eczema of the scalp is, of course, most frequently associated. In several of our cases there have been some slight desquamative changes of the lips, and in one case a lesion of the tongue, which was also probably of the same origin. The seborrheic eczema of Unna —with the exception of the condition of the scalp above referred to—we have never seen associated with this affection. When the disease has existed for a long period, the time, of course, varying as to the individual, minute telangiectases are formed on and immediately around many of the lesions in the form of thread-like vessels, and every lesion has a more dusky and rosaceous appearance. We may safely assert that the longer the disease has existed the more dusky the rosaceous is its appearance. This telangiectatic condition occurs most frequently in the center or seborrheic areas of the face and does not exist on the sides of the cheeks. Subjectively the patient will notice possibly a slight amount of itching, and when the disease is widely disseminated and has existed for some length of time there is a decided ting-

Fig. 1.—Acne rubra seborrheica.

ling and burning, which is markedly accentuated on exertion or by anything that will cause an increase of the congestion of the face. This seems to annoy the patient in many instances, and, with those in the lower walks of life, is the principal cause of their visit to the physician.

Acne rubra seborrheica always begins with the formation of a few papules, occurring on the chin and around the nose, and when it is widely distributed one can feel sure that it has existed for some years, as the disease extends very slowly. It does not appear in crops or acutely, but by gradual and slow extension of the process. Irritating applications, possibly soaps and various lotions, which the patient generally uses in the home treatment of this affection, no doubt add to the rapidity of its spread.

Acne rubra seborrheica is to be differentiated principally from: 1, A small papular syphilide; 2, acne vulgaris; 3, acne rosacea; 4, pustular folliculitis; 5, acne agminata (Crocker); 6, acne varioliformis; 7, adenoma sebaceum. The diagnosis is easily made when one bears in mind the following salient features: The seborrhoic base, associated in most instances with seborrhea of the scalp; papules of various sizes, ranging from a pin point to a split pea; superficial, convex papule, capped by a slight scale or covered with fine desquamation, containing no comedo or pus; dissemination being characteristic feature, grouping a question of accident; location in the seborrheic areas of the face; duration; subjective symptoms; tendency to flushing; often small telangiectases; no pitting or scarring; and, above all, a dry, non-suppurative superficial desiccating papule. These points are certainly sufficient to differentiate this papule from that of any of the above-named affections, without the therapeutic test, which is a final and positive differential point and will be spoken of later.

Petrini, in his original communication, classed this papule among the seborrheids for the reasons above

given, viz., its association with other seborrheic conditions. Pringle, who has written most clearly on this subject and adds to his article a colored plate, says that his case was labeled seborrheic eczema, but it was finally brought to the dermatologic society as a case for diagnosis; as it presented about the same condition as that described by us, although the eruption was more widely distributed than those usually seen, and it had more of the rosaceous element about it, it was undoubtedly an extreme type of this affection. Pringle also speaks in his article of a similar case described by Dr. Colcott Fox and one by Dr. Galloway. Dr. Fox's case contained no telangiectases, due probably to its short duration. Dr. Galloway's case had a great deal of general erythema and contained numerous small telangiectases, and, on first glance, had some resemblance to adenoma sebaceum, but on more careful examination it proved to be an entirely different affection.

It seems odd to us that this affection has not been previously brought to the general notice of the profession, and strange that more cases have not been reported. Our statistics show, from the St. Louis Skin and Cancer Hospital, and our private practices, 40 cases out of 1,000 cases of skin affections; from our clinic in the Skin and Cancer Hospital we have recorded 19 cases out of 500 cases of skin diseases; in private practice 64 out of 1,000 cases of skin diseases. All of the cases included in these statistics have undergone the therapeutic test and presented the characteristics of this affection above enumerated.

On account of the location of this disease it has not been possible for us to obtain material for microscopic study. In lieu of that we will take the liberty of quoting the report of a histologic examination by Dr. Graham Little, given in Dr. Pringle's article above mentioned:

Examination with low power (No. 3 Leitz): The small elevations corresponding to the papules are seen to center round

Fig. 2.—Acne rubra seborrheica.

a pilo-sebaceous follicle. The follicular orifice is not especially large or dilated, and there are no plugs as in acne. The hair in the follicle is not coiled on itself, or abnormal in any way. The horny layer is normal; there is no acanthosis. The only pathologic features noticeable are as follows: Around the hair follicle throughout its extent, but more especially in its deeper parts, there is an extensive infiltration of cells. In the case of the larger papules this mantle of cells exceeds two or three times the diameter of the cross-section of the follicle, as measured with a micrometer eyepiece; in the smaller papules the sheath of cells surrounding the follicle may consist of only a few layers of cells, but the hair-follicles, almost without exception, seem to have this surrounding envelope of cells. The collagenous bundles are displaced by these collections of cells and wall them in. The sebaceous glands appear in many cases abnormally large, but this enlargement is in no way comparable to that seen in sebaceous adenoma. The blood vessels appear normal and there is no other tissue change to note.

Examination with high power (1/12 oil immersion, No. 4 eyepiece, Leitz): The collections of cells round the pilo-sebaceous follicles consist of mononuclear and polynuclear leucocytes, with some connective-tissue corpuscles. There are no plasma cells or mast cells. The most careful examination for micro-organisms gave a negative result.

We have attempted a bacteriologic investigation of the papules and scales, but our findings are possibly of no value, as we could only demonstrate the organisms normally found on the seborrheic skin, viz., the flaschen bacillus of Unna, the polymorphic coccus (white coccus) of Cedercrentz, and Sabouraud's microbacillus of seborrhea. Whether we are to follow, in reasoning out the etiology of this disease, the dictum laid down by Sabouraud, namely, using his microbacillus of seborrhea as a pioneer, or not, is a matter of taste. The organisms mentioned are found in the normal skin, and it seems to us it is going rather far to state, dogmatically, that a certain bacillus, normally found in the skin, paves the way for secondary infection by other organisms also normally found in the skin. Therefore, we will pass this matter over by saying that the affection which we are attempting to describe should possibly be classed,

for the present at least, with the seborrheids, as it is closely associated with other seborrheic symptoms.

We do not believe that internal conditions, as far as the papule is concerned, have anything to do with its etiology. Flushing of the face, so characteristic in long-standing cases of this disease, is, in our opinion, secondary to the skin involvement, and is due solely to inflammatory changes produced by some infection, extending over long periods of time in a seborrheic skin. All of our cases presenting marked flushing and congestion have recovered by local treatment alone; therefore, we do not believe that there is any connection at all between this condition and the alimentary tract. Of course we are not now discussing the probable underlying seborrheic factor, whatever its cause may be.

The treatment of acne rubra seborrheica may be summed up in four words—salicylic acid and sulphur. All patients will recover in from two weeks to two months, no matter how severe, if properly treated with these drugs. In using sulphur and salicylic acid in this, as in other affections, we must begin with a weaker strength in an ointment base and gradually increase the strength, commensurate with the slightest amount of irritation of the normal skin of the patient. The stronger the preparation of salicylic acid and sulphur the quicker will be the recovery, provided one does not irritate too markedly the normal skin and produce a dermatitis.

Many of the patients appear for treatment after they have used various irritating and ineffectual applications, and we may find more or less of a dermatitis, which might probably mask the real condition. If acne rubra seborrheica is suspected soothing applications should be used until the latter affection becomes plainly evident, when mild applications of sulphur and salicylic acid can be ordered. Our usual procedure, where no dermatitis accompanies the disease, is to begin with 20 grains of sulphur precipitate and 5 grains of salicylic acid to the ounce of cold cream. This is gradually increased and

continued until the disappearance of the disease. No matter how mild the strength of the sulphur and salicylic acid, the patient will complain of its burning during the first applications.

If there is marked tendency to flushing and congestion, which occurs in the older cases, the internal administration of ichthyol and strychnin assists in the control of the vessels. Often mild applications of the Roentgen ray will hasten the disappearance of the lesions, and we believe it also assists in quieting the vessels to their proper tone.

After the patient has recovered from the papular elements of the disease the underlying seborrhea should be treated to prevent its recurrence, and the patients should be instructed to continue the treatment of the seborrhea in a routine manner and add it to the routine of their toilet, as they do their tooth powder or manicure set. For this purpose we generally use a solution of 1 per cent. of salicylic acid with 3 per cent. or boric acid in some spirit. Accompanying this we often order the following powder, which is lightly rubbed over the face, after it has been thoroughly mopped with the above-mentioned solution: Acid boric, sulphur precipitate, zinc oxid, pulv., calamin prep., equal parts. Such a routine procedure, when properly carried out, will almost always insure the patient against a relapse, and will markedly improve the oily seborrhea. The scalp in every instance should be treated in the manner usually employed for such cases.

PITYRIASIFORM SEBORRHEID OF THE FACE.

We will mention only in outline another condition of the face, which is in our experience rather frequent,, and we believe should also be included with the so-called seborrheids, as it is in every instance associated with a seborrheic condition of the scalp. It is most frequent in those with fine, delicate skins, occurring, therefore, especially among women and children, and more fre-

quently in blondes. We see more cases in the winter months, and in those who have been recently exposed to sharp winds, being markedly frequent in women after automobiling.

This disease occurs in the form of one or more scaly patches, scattered over the front of the face and sides of the neck. The patches are irregular in shape, ranging in size from the most minute point to an area often occupying more or less a quarter of the face surface; the usual size, however, corresponds to that of a small coin. There are very few, if any, inflammatory symptoms, and the patch can only be seen in many instances on close inspection. It is covered by fine, closely adherent scales, giving it an appearance of a branny, desquamative character. The edges are irregular in outline and the patches spread peripherally. Often the patches are distinctly circular and are mistaken by the patient for ringworm. When circular they have more of an inflammatory character and the edges are of a distinctly pale pink. In the center of these patches the scales are adherent, and there is a yellowish, reduced, parchment appearance to the whole area. The patient will state that these patches are prone to recur and are aggravated by the slightest irritation.

We have never seen this condition except on the face and neck, never on the hands or on the covered portions of the body. Crocker refers to a similar condition and speaks of it as produced by soaps. Sabouraud refers also to furfuraceous patches similar in character, complicating streptococci impetigo, and says they are also due to that organism. From a close study of these cases we feel assured that they have a direct connection with the so-called seborrheic element, and are most probably due to autoinfection from the scalp, occurring in those with dry, delicate skins, the exciting agents probably being cold winds, irritating soaps, harsh water, violent friction to the face, and other traumata, followed by infection.

We feel encouraged in making this statement when, on looking over our records, we find that antiseborrheic treatment is the most valuable curative agent, though this has to be used in as strong doses as possible. Often reducing agents will have to be pushed to marked exfoliation of the epidermis before the patches are eradicated. It seems to us that chemical and mechanical agents, such as soaps, etc., are only the exciting factors, and that this condition must be due to some living agent following such trauma, as it does not undergo involution, but spreads peripherally, as other infectious processes. It is only eradicated by the proper antiparasitic agents, which often have to be pushed to marked irritation of the normal skin and followed by soothing applications before a beneficial result is obtained. To prevent recurrences the scalp conditions should be most thoroughly treated, and it is only by this method that repeated attacks can be controlled.

These pityriasiform patches must not be confused with the usual seborrheic eczema with their yellow, greasy scales, or other acutely inflammatory conditions, because we have in this instance a furfuraceous patch, extremely superficial, circumscribed, with the slightest possible evidences of inflammation, slightly itchy, rather rebellious to treatment, sensitive to the slightest irritation, without vesiculation or crust formation.

DISCUSSION.

DR. JOSEPH ZEISLER, Chicago, stated that he admired the classical observations in this paper, but questioned whether it is opportune to overload our dermatologic nomenclature still further. In the one form of acne described we have simply a symbiosis of acne with seborrhœa; in the second variety we have those familiar cases which were usually described under the term of eczema squamosum.

DR. JAY F. SCHAMBERG, Philadelphia, said that for some years past he has seen, particularly during the spring months of the year, a considerable number of children with sharply defined, furfuraceous patches on the cheek, which were recorded as cases of eczema squamosum. He has long been suspicious, however, that they are of a seborrheic nature. The condition usually develops in March or April; he has ob-

served as high as 10 per cent. of the pupils in certain classes of certain schools to be affected with patches of this kind. Whether the affection is the result of the harsh winds that usually prevail at this particular season, or whether it is transmitted from one child to another is a question which he is unable to answer. It is, he said, very difficult to speak concretely on the subject of seborrhides, as we have not a very clear comprehension of what seborrhides really are, nor are we in accord as to the etiologic factors that have been described in connection with seborrheic processes. Some years ago he examined the skin of fifty patients who came to the dermatologic clinic, for various reasons, and in 45 per cent. of these cases, the sebaceous glands contained the microbacillus of Sabouraud. Whether this organism bears any special pathogenic relationship to the class of eruptions under discussion future investigation must determine. It has not been positively proved that the microbacillus is not a normal inhabitant of the sebaceous glands, although Sabouraud certainly makes out a strong case for its pathogenicity in relation to oily seborrhea.

DR. W. H. MOOK, St. Louis, said, in regard to the pityriasic affections of the face and neck which are embraced under the second heading, he would insist that this is certainly a distinct condition from eczema, and should be so regarded. The idea of his classification of this form of acne is to distinguish it from the other forms, as it is, in his opinion, a distinct entity.

A CASE OF TUBERCULOSIS INVOLVING THE NOSE WITH DESTRUCTION OF THE DEEPER TISSUES.

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PHILADELPHIA.

The following is the report of the patient whom I presented for consideration to the Section on Cutaneous Medicine and Surgery of the American Medical Association at the session held in Atlantic City, June, 1907. The description of the case then given was informal and I now present a detailed history:

Patient.—Mrs. J. C. M., aged 43, housewife; nativity, United States.

Family History.—Mother died of paralysis at the age of 55 years, father of nephritis at the age of 50 years. The family history is negative as regards cancer, tuberculosis, gout and rheumatism.

Previous History.—As a child she had measles, chickenpox, mumps and scarlet fever. Three years ago she had ulceration of the stomach. She denies venereal disease.

Present Illness.—Two years ago she walked against the edge of a door and received a fracture of the nose, which did not unite until one year after the injury, but during this time the nose was in a sonstant state of inflammation. Six weeks after the fracture united a papule the size of a split pea developed on the left ala of the nose, which on rupturing was rapidly followed by ulceration. The ulceration spread quickly to the left cheek and upper left half of the lip. Later the ulceration further spread over the tip of the nose to the right ala and now involves the entire nose with destruction of the cartilage and deeper tissues.

Physical Signs.—Lungs apparently normal. Heart: A mitral systolic murmur, compensation good. Abdominal viscera normal. Lymphatic glands not enlarged and the skin over the body shows no scars of previous syphilitic infection.

Laboratory Findings.—Urinalysis: Albumin, negative; sugar, negative; indican, slight trace; reaction, acid; specific gravity, 1018; color, amber.

Blood Examination: Hemoglobin, 87 per cent.; leucocytes, 8,000; erythrocytes, 4,273,460.

Microscopic Examination.—A section of the diseased tissue was examined by Dr. L. Napoleon Boston, Philadelphia, with the following results: (1) Superficially the tissue resembled that ordinarily present in cutaneous ulcerations, e. g., consisted of débris and many polymorphonuclear cells. (2) The deeper structures showed some increase in the epithelium, and there were here and there what appeared histologically to be distinct tubercles, with the presence of giant cells. (3) Sections stained for bacillus tuberculosis were positive in but one instance, and but few tubercle bacilli were found, but sufficient, however, to make the diagnosis positive.

The sections of the skin were unusual, says Dr. Boston; a number of skin specialists who had seen this case with me agreed that it is extremely uncommon to find tubercle bacilli in the skin, and one man went so far as to say that he thought they were never found. In view of the frank statements of these workers, I had a specimen sectioned and stained up for tubercle bacilli by Dr. Rosenburg, pathologist and bacteriologist for the Philadelphia City Hospital, one of the best workers in Philadelphia. In proof of my own findings Dr. Rosenburg found bacilli in the skin from this case. I also had another pathologist look at some of the sections, and in fact nearly all the physicians at the Philadelphia City Hospital saw them, as they were unusually good specimens of cutaneous tuberculosis.

The first examination of a section did not reveal the tubercle bacillus, but many polymorphonuclear and giant cells.

Thus, the second examination of the tissue confirms the suspected diagnosis of tuberculosis, which was based on the fact that the lesion showed no tendency to heal, but slowly and steadily increased in size by peripheral extension. The ulcer looks bright red in color, with slightly infiltrated edges, is uneven, granular, and covered with a thin yellowish secretion. At the beginning of the ulceration the spot was very painful, but manifested no tendency to bleed even when touched.

As a rule, patients having tubercular ulcers have pulmonary tuberculosis, whence the infection, which is not the case in this

patient. It is possible that she received the infection at the time she met with the accident, because the fracture did not unite for a year, during which time the nose was constantly in a stage of active inflammation.

Treatment.—Her family physician in Atlantic City thought the patient had syphilis and gave her, before she came under my care, a full course of iodids, to which the inflammation did not yield in the least. A thorough course of iodid as well as mercury was also given her again before she came under my observation, but without any good effect. The treatment thus far has been of no avail to stop the destructive action of the ulceration. The following combination greatly relieved the pain of the ulceration and lessened the thin yellowish discharge:

℞.	Creosoti (beechwood)	m. x	60
	Atropinæ sulphatis	gr. ii	13
	Cocainæ hydrochlorici	gr. v	32
	Aquæ hamamelidis	fl℥ii 60	
	Liquoris calcis	fl℥iv 120	

M. Sig.: Apply locally on a cloth.

Believing, as I stated at the demonstration that I made at Atlantic City, that I was dealing with a case of ulceration due to tuberculosis, I cauterized the surface with pure phenol (carbolic acid) every three or four days and applied constantly the solution just named. At the same time, as the patient's blood test showed decided deterioration, blood tonics with antiseptics were given daily, together with good food. The food, which is all important in all such cases, as it is in general tuberculosis, consisted of plenty of animal food, such as soft-boiled eggs (not raw eggs). The latter, as I have shown time and again in previous reports, are hard to digest and often so disgust the patients as to have them refuse all kinds of food or to give them bad indigestion. Very often in forced feeding with raw eggs, I have been able to collect the eggs in the fecal discharges of the patients. In addition to eggs, plenty of animal broths, especially of beef juice, and a moderate amount of milk were given. In addition, a few well-cooked vegetables and fruits were permitted. Medicinally, the patient was given small doses of paraldehyd, from one-half to one dram at bedtime in order to obtain sleep. The paraldehyd was mixed with aromatic and wild cherry syrups. The addition of these syrups disguises to a large extent the unpleasant taste of paraldehyd. In nervous patients, suffering as this patient has for weeks from this irritable ulceration of the face, paraldehyd is one of the very best of all hypnotics. It is well borne by the mucous membrane and has

no unpleasant action on the heart and circulation. Further, paraldehyd can be given for a great length of time and has no bad after-effects, either at the time of administration or the following day. It is one of the best and most stable hypnotics or sleep-producing agents. Small doses of beechwood creosote were administered, beginning with one drop and increasing to eight and ten drops three times daily in a bitter tonic. Under this treatment, I am happy to add that my patient at once improved, her pallor lessened, the ulceration looked better, her appetite and strength were increased with each succeeding day. When she left the hospital some weeks after the meeting I ordered the following tonic and antiseptic:

℞.	Ferri lactatis	gr. xxx	1|95
	Arsenii trioxidi.....	gr. i	|06
	Quinin sulphatis.....	gr. xxx	1|95

M. et ft. pilulæ No. xxx. Sig.: One pill three times a day after meals.

I hope, if the patient will present herself at stated intervals at the hospital, with the local and constitutional treatment given, to heal up and restore the tuberculous ulceration to the state of at least scarred tissue.

DISCUSSION.

Dr. Joseph Zeisler, Chicago, said that lupus could be excluded in this case from the fact that the bone had been destroyed to a considerable extent. Such destructive bone lesions are not seen in lupus. Epithelioma and blastomycosis could also be excluded. The medication that is indicated in such a case is potassium iodid and mercury, and the application of mercurial plaster.

Dr. R. A. McDonnell, New Haven, agreed entirely with Dr. Zeisler as to diagnosis and treatment.

Dr. Henry J. F. Wallhauser, Newark, N. J., also agreed with Dr. Zeisler's diagnosis. He asked Dr. Shoemaker if the microscope showed the tubercle bacilli. Both in the disease referred to by Dr. Zeisler and in tuberculosis, the microscope shows plasma and giant cells, so that, unless the tubercle bacillus was found, the histologic findings would not be of any value in the differential diagnosis between the disease mentioned and tuberculosis.

Dr. A. Ravogli, Cincinnati, said that last year he saw two cases very similar to the one presented, in which the lesions were the result of lupus. One patient had since died; the other is still living. In both the disease began with a small nodule of lupus affecting the auricle of the ear, then extending to the zygomatic arch, involving the temporal and occipital bones, and in the patient who is still living the nerves and blood vessels of the parts have become exposed. A part of the

temporal bone had been destroyed, and the patient's death is expected shortly.

Dr. Ravogli believes the case shown by Dr. Shoemaker to be one of true tuberculosis, and the microscopic examinations thus far made seem to confirm that diagnosis. Tubercle bacilli affecting the papillary layer or derma remain limited there, and form what is called lupus vulgaris, but when they extend beyond the domain of the derma and affect the subcutaneous tissues, then true tuberculosis exists. Even if in the case presented no tubercle bacilli were found that would not prove that it is not a case of tuberculosis. In the skin it is very difficult to find the tubercle bacilli, even after an examination of hundreds of sections. In these cases, the microorganism is in spore form, and we are unable to stain it as when it is found in the lungs. He said there seems no doubt that in the case presented the tubercle bacillus is the essential agent, and that it has left the derma and invaded the subcutaneous tissues.

Dr. Jay F. Schamberg, Philadelphia, said that while one can not be positive beyond doubt as to the nature of the lesion in the patient presented, the condition looks so strongly luetic that nothing but the failure of vigorous doses of mercury and potassium iodid would negative that diagnosis. Potassium iodid alone would not prove an adequate therapeutic test.

Dr. J. B. Kessler, Iowa City, agreed with Dr. Zeisler that vigorous specific treatment should be given a trial in this case. It seemed to be a promising case for the use of injections of either the soluble or insoluble preparations of mercury.

Dr. Granville Mac Gowan, Los Angeles, Cal., said that if the patient presented came to him for treatment he would not restrict himself to the use of mercury and potassium iodid. The lesion is evidently rapidly destroying the face, and from the appearance and history, it is tuberculous. The statement, frequently made, that the diagnosis of luetic disease can be established or excluded by the use of potassium iodid and mercury is only a half truth. No two other drugs are more valuable than these in the treatment of tuberculosis of the skin, and then it is possible to have tuberculosis engrafted on pre-existing syphilis. He suggested that further sections be taken and submitted to a competent bacteriologist, and if the bacilli are found, or the microscopic picture is characteristic of tuberculosis, surgical measn should be resorted to. This would include a thorough curettage of the bones, and the removal, as completely as possible, of all the diseased tissues. After this a 50 per cent. solution of chlorid of zinc should be applied, at the same time giving intradermic injections of the soluble salts of mercury and administering potassium iodid internally. The case seemed to him to be a surgical one, demanding surgical treatment.

DR. R. W. TAYLOR, New York City, said that there might be a syphilitic basis to the lesion, and he would be disposed to try Zippmann's decoction.

DR. J. V. SHOEMAKER, Philadelphia, said that he saw the patient in this case only two or three times while she was in the hospital, and did not see her again until he presented her to the Section. Her physician had informed him that she had been under all forms of anti-syphilitic treatment, and that it had had no effect on the course of the disease. When the patient came to the hospital she had a good deal of pain. which may have been due to the exuberant granulations or the disease itself; at all events, it was very severe, and the only internal remedy that allowed her to sleep was paraldehyd, in one or two dram doses. Dr. Shoemaker was led to believe by the result of the pathologic findings of Dr. Napoleon Boston that the necrosis and changes in the tissues were of a tuberculous character.

THE CYTOLOGY OF GONORRHEAL DISCHARGES.

ROBERT W. TAYLOR, M.D.
Consulting Genitourinary Surgeon to the Bellevue and Charity (City) Hospitals.
NEW YORK CITY.

Within the past five or six years considerable attention has been directed to the study of the finer structural details, in other words, the cytology of the elements of the discharge of urethritis. This line of study, as well as the methods employed, is practically an application of the recent advances in the morphology of the blood. It is somewhat difficult to see what particular purpose this work subserves, for it has not helped us in understanding the nature of the process nor has it given any aid from a prognostic standpoint. And after reviewing the subject and supplementing it with some personal observations I have come to the conclusion that any clinical aid or therapeutic guidance from this whole line of work, although sustained by a large volume of literature, is of very doubtful value. It is not susceptible of practical application.

I shall endeavor to lay the subject before you, however, through these personal observations, which, although limited to some 18 cases of ordinary gonorrhea, 5 cases of vulvo-vaginitis in children and 2 cases of gonorrheal ophthalmia, seem to me to cover the field sufficiently for our purposes, as well as would the study of cases by the hundreds. Considerable time has been expended on the relative advantages of various staining mixtures, the methods of fixing the smears, etc., which

merely involves the consideration of rather immaterial details. I have found Wright's method of staining blood smears the most practical, since it is very convenient and differentiates the various cellular elements in the discharges and exhibits perfectly their structural details.

As every one knows, the predominant cellular element in gonorrheal discharge all through its course and even in the stage of the threads is the ordinary pus cell or leucocyte, the neutrophilic, polymorphonuclear leucocyte. The only excepton to this is the exceedingly early initial and evanescent stage when there may be a considerable proportion of desquamated epithelial cells. These leucocytes are seen in Figures 1 to 5 and 31, and are the cells in which, as shown in Figure 7, the gonococci are most frequently, indeed almost invariably found, although, of course, they may be found in uninuclear cells and on the surface of epithelial cells.

Occasionally among the leucocytes the eosinophilic variety is found, which never contain gonococci and are pictured in Figure 6. These very striking structures, crowded with coarse, brilliant, red granules, have naturally attracted attention from nearly all writers on the subject, and they have endeavored to connote their presence with some particular stage of the disease. There is an impression that this type of leucocyte is present in greatest number in the first month of the discharge. The several statements on this point are very discordant. Both C. and H. Posner[1] regard the advent of the eosinophiles as occurring up to the fourth or sixth week of the discharge. After that they gradually decline. Joseph and Polano[2] also subscribe to this statement and have persuaded themselves into the belief that the decline of the osinophiles indicate that the process has reached

1. Posner (H. L.): Zur Cytologie des gonorrhoischen Eiters, Berlin, klin. Wochschr., Oct. 22, 1906, 1401.

2. Joseph (Max) and Polano (M. E.): Cytodiagnostische Untersuchungen Gonorrhoischer Sekrete, Archiv. für Dermatologie und Syphilis, lxxvi, 1905, 65.

its culmination. On the other hand, Bettman has found voluminous eosinophiles late in the disease, in the gleety stages. Among their tables Joseph and Polano record finding them in the eleventh month of the discharge. In our observation we have found that they are just as liable to be absent as present in the first four weeks of the affection. So, as a matter of fact, there is no definite period which is distinctly related to the advent of the eosinophiles. They may be absent in the early period and, on the other hand, they may be found all through the course of the disease. According to Pelagatti,[3] the eosinophiles appear in the first few days of the malady; they then disappear, only to reappear later on in small numbers. When the discharge is treated, Pelagatti thinks that the presence of the eosinophiles is wholly irregular and without any value whatever. Joseph and Polano think that the inverse proportion of the eosinophiles to the number of gonococci present is of prognostic significance. It remains to be seen, however, if this will stand the test of time and abundant experience.

Another cell component of gonorrheal discharge of rather comparatively infrequent occurrence is the presence of the mast-cell. These we have met with only once in a case of gonorrheal ophthalmia. They are pictured in Figure 8 as they appear stained with Unna's procedure. Joseph and Polano found them in 30 cases out of 200. They seem to have no particular significance.

Considerable attention has been given to the mononuclear basophilic cells in gonorrheal discharges pictured in Figures 16 to 19 and 20 to 22. The first set of figures correspond to the small lymphocytes and the latter to their companions, the large lymphocytes. The smaller cells are, in our experience, less frequent than the larger ones. Pappenheim thought that these cells indicate the period of healing and restitution of dam-

3. Pellagatti (M.): La Constitutione anatomica del Pus blennorrhagico, Giornale Ital. delle Mutattie Veneree e della Pelle, Fasc. 3, 1906, 237.

aged tissues in the disease. This turns out to be rather conjectural, however, for these cells are found all through the course of the disease. Neuberger[4] shows the instability of this conclusion for lymphocytes, and mononuclear leucocytes are found not only in the subacute stages, but in the acute also.

Various degenerative changes of no particular significance occur in the several cells. Thus, in Figure 2 there are small buds of the substance of the cell which, when free, may give rise to small spherical bodies shown in Figure 14. Other changes are vacuoles in the cell body, as shown in Figures 5 and 7 and of the nucleus in Figure 4. These vacuoles in the cytoplasm have been regarded by H. Posner as indications of phagocytic activity of the cell. According to this idea, these spaces are holes which correspond to particles, not necessarily gonococci, which have previously been ingested and dissolved by the cell. This interpretation is somewhat guesswork and the spaces may indicate something entirely different.

A very curious and interesting phenomenon, although without any special bearing on the matter in hand, is segmentation of lobes of the leucocytes together with the inclusion of nuclear material. For instance, in Figure 8 and also Figure 10, which shows a single leucocyte, this process of segmentation is illustrated. Whole lobes of the cell are in the act of being detached with included masses of nuclear material. In this way small round nucleated bodies about the size of a blood placque are produced which are shown in Figures 11, 12 and 13. This, as far as I know, has escaped the attention of other observers.

Still another cell element occurring occasionally in the discharge is the so-called "ball nucleated" leucocytes (Figs. 24 to 27). These are well named, for the nuclei are perfectly spherical, very deeply staining and

4. Neuberger (J.): Ueber gonorrhoische Secretumtersuchungen, Congress der Deutschen Dermalogische Gesellschaft in Bern, 1906.

opaque, and without any connecting filaments or bridges between the nuclei. Thus, they are peculiar and can be easily distinguished. Posner, finding them more frequently in non-gonococcic urethritis than in other varieties, intimated that their presence was a hint that the discharge was of the non-specific form of one in which the gonococci had disappeared, or was associated with other organisms or toxins. The trouble with this assumption is that such peculiar cells are found in ordinary gonorrhea just often enough to make it of very little use. The cells corresponding to Figures 24 to 27 were found in an ordinary gonococcus urethritis in the tenth week. The "ball nuclei" cells are merely transformed leucocytes and depend on certain conditions apparently unassociated definitely with any particular type or phase of urethritis. Neuberger observed them more particularly in the morning exudate.

Phagocytosis may occur to some extent in gonorrheal discharges, but I have not thought the phenomenon of sufficient bearing on the study or treatment of urethritis to show more than one or two instances in Figures 28 and 29. The article of Neuberger[5] may be consulted if one desires to follow out the confusing and complex morphologic pictures which are given there with considerable elaboration.

In Figure 28 is a lymphocyte, a macrophage of Metchnikoff, in the apparent act of engulfing a polynuclear leucocyte, which latter seems undergoing digestion or disintegrative changes. In Figure 29—taken from an early discharge with considerable diapedesis of red blood cells—there is an apparent ingestion and partial destruction of two red blood cells by a macrophage. It may be, however, that these red cells, instead of being engulfed by the macrophage, are simply mechanically and accidentally attached to its surface. This may also

5. Neuberger (J.): Uber die Morphologie, das Vorkommen und die Bedentung der Lymphocyten und uninucleären Leukocyten im gonorrhoischen Urethralsekret nebst Bemerkungen uber die sog. Kugelkerne, Virchow's Archiv. zur pathologische Anatomie und Physiologie und für Klinische Medizin, clxxxvii, No. 2, 1907, 309.

be the interpretation of Figure 30 taken from Sprecher's[6] paper (devoted to the phagocytosis of red cells in gonorrheal exudate). This is a very minor point, however, for whether engulfed or merely lying on the surface the result is much the same, the red cell seems undergoing dissolution from the action of substances secreted by the phagocyte. Incidentally some of Sprecher's pictures are, perhaps, a little divergent from the current ideas of phagocytosis, since he shows microphagi engulfing red cells instead of macrophagi. However, that macrophagi rather than microphagi are concerned with the engulfing of animal cells is a general rather than an absolute rule. To sum the matter up, it seems to me that all of this detailed study of cellular elements of gonorrheal discharge, interesting as it may be, has contributed very little to our understanding of the nature, prognosis or treatment of urethritis.

6. Sprecher (F.): Ein Beitrag zur Cytologie des Gonorrhoischen Eiters, Archiv. für Dermatologie und Syphilis, lxxviii, No. 3, 407.

MINUTES OF 1907 SESSION

TUESDAY, JUNE 4—AFTERNOON.

The meeting was called to order by the chairman, Dr. R. R. Campbell, Chicago, who then delivered the chairman's address, "Venous Angioma of Skin Showing Beginning Malignancy."

A paper on "Deformities of the Vulva from Early and Late Indurating Edema" was read by Dr. R. W. Taylor, New York City. Discussed by Drs. H. C. Baum, Syracuse, N. Y.; J. Zeisler, Chicago; W. A. Pusey, Chicago; W. S. Gottheil, New York City, and R. W. Taylor, New York City.

A paper entitled "Blastomycosis in an Infant" was read by Dr. J. B. Kessler, Iowa City, Iowa. Discussed by Drs. W. A. Pusey, Chicago; H. C. Baum, Syracuse, N. Y.; W. T. Corlett, Cleveland; J. A. Fordyce, New York City; J. F. Schamberg, Piladelphia; M. B. Hartzell, Philadelphia, and J. B. Kessler, Iowa City, Iowa.

A paper on "Significance and Treatment of Itching" was read by Dr. L. Duncan Bulkley, New York City. Discussed by Drs. W. T. Corlett, Cleveland; G. T. Jackson, New York City, and L. D. Bulkley, New York City.

"Some Seborrhoids of the Face" was the title of a paper by Drs. M. F. Engman and W. H. Mook, St. Louis, read by Dr. Engman. Discussed by Drs. J. Zeisler, Chicago; J. F. Schamberg, Philadelphia, and W. H. Mook, St. Louis.

A paper entitled "The Salicylates in the Treatment of Lichen Planus; Some Unusual Forms of This Affection," was read by Dr. M. B. Hartzell, Philadelphia. Discussed by Drs. W. S. Gottheil, New York City; J. Zeisler, Chicago; J. B. Kessler, Iowa City, Iowa; G. T. Jackson, New York City; R. W. Taylor, New York City; L. D. Bulkley, New York City; W. T. Corlett, Cleveland, and M. B. Hartzell, Philadelphia.

A paper was read on "Liquid Air in Dermatology; Its Indications and Limitations," by Dr. H. H. Whitehouse, New York City. Discussed by Drs. H. W. Stelwagon, Philadelphia; W. A. Pusey, Chicago; G. T. Jackson, New York City; L. D. Bulkley, New York City; J. D. Gold, Bridgeport, Conn.; L. S. Shoninger, New York City; W. S. Gottheil, New York City, and H. H. Whitehouse, New York City.

WEDNESDAY, JUNE 5—AFTERNOON.

The chairman appointed a nominating committee of three members for the election of officers for the ensuing year.

Dr. John A. Fordyce of New York City, Secretary-General of the Sixth International Dermatological Congress, announced that the Sixth International Dermatological Congress will meet in New York City Sept. 9-14, 1907. A committee of the American Dermatological Association and of this Section of the American Medical Association extended an invitation to the International Dermatological Congress at the Berlin meeting to meet in this country in 1907, which invitation was accepted. An organization committee had been appointed, subjects selected for discussion, and prominent men from abroad secure to participate. In addition to this, they have the promise of over 60 papers, so that from a scientific standpoint, the congress promises to be a success. The membership of the congress already numbers about 150, including about 40 members from abroad. Over $9,000 has already been collected, while more than $12,000 has been pledged to meet the expenses of the congress, the entertainment of the visiting members, etc. Dr. George T. Jackson, the treasurer, or Dr. Fordyce will receive applications for membership and furnish further information and printed matter.

A paper on "Ten Years' Experience with the Injection Treatment of Syphilis" was read by Dr. W. S. Gottheil, New York City. Discussed by Drs. R. W. Taylor, New York City; A. Ravogli, Cincinnati; J. Zeisler, Chicago; G. MacGowan, Los Angeles, Cal.; H. Klotz, New York City; L. E. Schmidt, Chicago; M. B. Hartzell, Philadelphia; J. F. Schamberg, Philadelphia; J. A. Fordyce, New York City; W. H. Davis, Denver; W. T. Corlett, Cleveland; L. D. Bulkley, New York City; W. S. Gottheil, New York City.

A paper on "The Vessel Changes and Other Histologic Features of Cutaneous Syphilis" was read by Dr. J. A. Fordyce, New York City. Discussed by Drs. J. F. Schamberg, Philadelphia; W. A. Pusey, Chicago; A. Ravogli, Cincinnati; W. H. Mook, St. Louis; W. S. Gottheil, New York City; M. B. Hartzell, Philadelphia; R. W. Taylor, New York City; C. A. Kinch, New York City, and J. A. Fordyce, New York City.

"The Differential Diagnosis of Syphilis" (illustrated by lantern slides) was the title of a paper read by Dr. W. T. Corlett, Cleveland.

A paper entitled "Lupus Erythematosus; Some Clinical and Pathologic Considerations" (demonstrated from lantern slides) was read by Dr. M. L. Heidingsfeld, Cincinnati.

A paper on "The Present Status of Phototherapy" was read by Dr. Jay F. Schamberg, Philadelphia. Discussed by Drs. Wm. S. Gottheil, New York City; L. D. Bulkley, New York City; W. T. Corlett, Cleveland; J. F. Wallis, Norristown, Pa.; M. L. Heidingsfeld, Cincinnati; J. H. Mudgett, Philadelphia, and J. F. Schamberg, Philadelphia.

Dr. L. D. Bulkley, New York City, moved that the House of Delegates be requested to direct the proper authorities to

send a complete program of this Section, from three to five days before the next annual meeting, to each member of the Section who has registered this year. The motion was carried.

Dr. Bulkley said that a great deal of dissatisfaction had been expressed with the present name of the Section, which was changed some years ago from that of the Section on Dermatology to that of the Section on Cutaneous Medicine and Surgery. The word "surgery" in the title misled many into the belief that the surgery was general rather than cutaneous. He therefore moved that a committee be appointed, consisting of the incoming officers of the Section and the members of the executive committee, for the purpose of corresponding with the members of this Section in order to obtain an expression of opinion as to what name they consider most advisable, and that this committee report at the next meeting of the Section. The motion was carried.

The chairman named the following nominating committee: Drs. William Baum, Chicago; John A. Fordyce, New York City, and W. T. Corlett, Cleveland.

The chairman announced that volumes of the transactions of the various sections of the last meeting of the American Medical Association were ready for distribution, and that members could receive the same by making proper application. If desired, the volumes subscribed for will be sent yearly until the order is canceled.

Thursday, June 6—Afternoon.

Dr. William L. Baum, Chicago, the chairman of the nominating committee, reported as follows: Chairman, Dr. M. B. Hartzell, Philadelphia; vice-chairman, Dr. Granville MacGowan, Los Angeles; secretary, Dr. M. L. Heidingsfeld, Cincinnati; delegate, Dr. R. R. Campbell, Chicago; alternate, Dr. J. B. Kessler, Iowa City, Iowa. These officers were elected as nominated.

A paper on "Observations on Pemphigus" was read by Dr. Joseph Zeisler, Chicago. Discussed by Drs. W. T. Corlett, Cleveland; J. A. Fordyce, New York City; J. F. Schamberg, Philadelphia; J. B. Kessler, Iowa City, Iowa; L. D. Bulkley, New York City; A. Ravogli, Cincinnati, and J. Zeisler, Chicago.

A patient was exhibited by Dr. J. V. Shoemaker, Philadelphia, and the case was discussed by Drs. J. Zeisler, Chicago; R. A. McDonnell, New Haven, Conn.; H. T. F. Wallhauser, Newark, N. J.; A. Ravogli, Cincinnati; J. F. Schamberg, Philadelphia; J. B. Kessler, Iowa City, Iowa; G. MacGowan, Los Angeles; R. W. Taylor, New York City, and J. V. Shoemaker, Philadelphia.

A paper entitled "Opsonic Therapy as Applied to Skin Diseases" was read by Dr. H. R. Varney, Detroit. Discussed by Drs. J. F. Schamberg, Philadelphia; R. A. McDonnell, New

Haven, Conn.; M. L. Heidingsfeld, Cincinnati; J. Zeisler, Chicago; W. H. Mook, St. Louis; M. B. Hartzell, Philadelphia, and H. R. Varney, Detroit.

A paper on "Onychomycosis" was read by Dr. A. Ravogli, Cincinnati. Discussed by Drs. J. B. Kessler, Iowa City, Iowa; G. MacGowan, Los Angeles; M. L. Heidingsfeld, Cincinnati, and A. Ravogli, Cincinnati.

"The Therapeutics of Tuberculous Lesions of the Skin" was the title of a paper read by Dr. Granville MacGowan, Los Angeles.

A paper on "Roentgen Ray Technic in Dermatology" was read by Dr. M. K. Kassabian, Philadelphia.

A paper entitled "Treatment of Acne and Chronic Eczema" was read by Dr. Russell H. Boggs, Pittsburg.

These three papers were discussed by Drs. M. B. Hartzell, Philadelphia; G. E. Pfahler, Philadelphia; C. Leonard, Philadelphia; J. F. Chamberg, Philadelphia; R. H. Montgomery, Youngstown; G. MacGowan, Los Angeles; M. K. Kassabian, Philadelphia, and R. H. Boggs, Pittsburg.

"The Cytology of Gonorrheal Discharges" was the title of a paper read by Dr. Robert W. Taylor, New York City. This paper was not on the program, and a motion was passed by the Section allowing it to be read.

A paper on "Report of a Series of Cases of Small Pustular Scrofulide (Dühring)" by Dr. J. Frank Wallis, Norristown, Pa., was, because of lack of time, read by title.

On motion, the Section voted to include in the Transactions the articles by Drs. H. G. Anthony, Chicago, and A. D. Newborn, New York.

Dr. H. R. Varney, Detroit, announced that at the morning session of the House of Delegates he had presented the motion passed by the Section yesterday in regard to sending the members of the Section a sectional program a few days prior to the next meeting. The motion had been referred to the Committee on Section Work, and they had reported adversely on it, claiming that if this privilege were extended to one section, other sections would also claim it, and that this would entail considerable expense. It was suggested instead that the full papers be prepared and printed in time to place copies in the hands of the members beforehand.

Dr. Hartzell, the incoming chairman, thanked the members of the Section for the honor they had conferred on him.

A vote of thanks was extended to the retiring chairman, Dr. Campbell, and to the secretary, Dr. Heidingsfeld, for their zealous and efficient work on behalf of the Section.

LIST OF MEMBERS OF THE SECTION ON CUTANEOUS MEDICINE AND SURGERY.

List of present members of the American Medical Association who are making a specialty of cutaneous medicine and surgery. The numbers after the names indicate the record of attendance at annual sessions. (2 indicates, 1902; 3, 1903; etc. The Section did not meet in 1905.)

Alderson, M. E., Russellville, Ky. 6.
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INDEX

PAGE.

Acne and chronic eczema, treatment of..... 228
Anthony, H. G., lichen scrofulosorum..... 81
Baum, H. C., discussion on infantile blastomycosis..... 257
Blastomycosis in an infant..... 253
Boggs, R. H., discussion on skin diseases..... 236
Boggs, R. H. treatment of acne and chronic eczema 228
Bulkley, L. D., discussion on itching, 73; on lichen planus, 198; on liquid air in dermatology, 135; on pemphigus, 168; on phototherapy, 155; on treatment of syphilis, 52; significance and treatment of itching 54
Campbell, R. R., venous angioma of skin showing beginning malignancy 9
Chairman's address 9
Corlett, W. T., discussion on infantile blastomycosis, 258; on itching, 72; on lichen planus, 199; on pemphigus, 166; on phototherapy, 156; on treatment of syphilis..... 52
Davis, W. H., discussion on treatment of syphilis..... 52
Discussion on cutaneous syphilis, 100; on deformities of vulva, 35; on infantile blastomycosis, 257; on itching, 72; on lichen planus, 197; on liquid air in dermatology, 133; on onychomycosis trichophytina, 190; on opsonic therapy in skin diseases, 178; on pemphigus, 166; on phototherapy, 154; on skin diseases, 233; on treatment of syphilis, 46; on tuberculosis of nose..... 274
Engman, M. F., seborrheids of the face 260
Fordyce, J. A., discussion on cutaneous syphilis, 101; on infantile blastomycosis, 258; on pemphigus, 167; on treatment of syphilis..... 51
Fordyce, J. A., vessel changes and other histologic features of cutaneous syphilis 86
Gold, J. D., discussion on liquid air in dermatology..... 135
Gonorrheal discharge, cytology of..... 277
Gottheil, W. G., discussion on cutaneous syphilis, 100; on deformities of vulva, 35; on lichen planus, 197; on liquid air in dermatology, 136; on phototherapy, 154; on treatment of syphilis 53
Gottheil, W. S., treatment of syphilis by intramuscular injections of insoluble mercurials 37
Hartzell, M. B., discussion on cutaneous syphilis, 100; on infantile blastomycosis, 259; on lichen planus, 199; on opsonic therapy in skin diseases, 180; on skin diseases, 233; on treatment of syphilis..... 50
Hartzell, M. B., salicylates in treatment of lichen planus..... 192
Heidingsfeld, M. L., discussion on onychomycosis trichophytina, 190, 191; on opsonic therapy in skin diseases, 179; on phototherapy 156

PAGE.
Heidingsfeld, M. L., lupus erythematosus 237
Itching, significance and treatment of 54
Jackson, G. T., discussion on itching, 72; on lichen planus, 198; on liquid air in dermatology 135
Kassabian, M. K., discussion on skin diseases 236
Kassabian, M. K., Roentgen ray technic in dermatology 200
Kessler, J. B., blastomycosis in an infant 253
Kessler, J. B., discussion on infantile blastomycosis, 259; on lichen planus, 198; on onychomycosis trichophytina, 190; on pemphigus, 168; on tuberculosis of the nose 275
Kinch, C. A., discussion on cutaneous syphilis 100
Klotz, H. G., discussion on treatment of syphilis 49
Leonard, C., discussion on skin diseases 234
Lichen planus, salicylates in treatment of 192
Lichen scrofulosorum 81
Liquid air in dermatology 116
Lupus erythematosus 237
MacGowan, G., discussion on onychomycosis trichophytina, 191; on skin diseases, 235; on treatment of syphilis, 49; on tuberculosis of the nose 275
MacGowan, G., tuberculosis of the skin 211
McDonnell, R. A., discussion on opsonic therapy in skin diseases, 179; on tuberculosis of nose 274
Members of the Section 287
Mewborn, A. D., trichopathophobia 102
Minutes of 1907 Session 283
Montgomery, R. H., discussion on skin diseases 235
Mook, W. H., discussion on cutaneous syphilis, 100; on opsonic therapy in skin diseases 180
Mook, W. H., seborrheids of the face 260
Mudgett, J. H., discussion on phototherapy 157
Onychomycosis trichophytina 182
Pemphigus, observations on 159
Pfahler, G. E., discussion on skin diseases 234
Phototherapy, present status of 138
Pusey, W. A., discussion on deformities of vulva, 35; on infantile blastomycosis, 257; on liquid air in dermatology 133
Ravogli, A., discussion on cutaneous syphilis, 100; on onychomycosis trichophytina, 191; on pemphigus, 169; on treatment of syphilis, 47; on tuberculosis of nose 274
Ravogli, A., onychomycosis trichophytina 182
Roentgen ray technic in dermatology 200
Schamberg, J. F., discussion on infantile blastomycosis, 258; on opsonic therapy in skin diseases, 178; on pemphigus, 167; on phototherapy, 157; on skin diseases, 235; on treatment of syphilis, 51; on tuberculosis of nose 275
Schamberg, J. F., present status of phototherapy 138
Schmidt, L. E., discussion on treatment of syphilis 50
Seborrheids of the face 260
Shoemaker, J. V., discussion on tuberculosis of the nose 276
Shoemaker, J. V., exhibition of patient with tuberculosis of nose 271
Shoninger, L. S., discussion on liquid air in dermatology 136
Skin diseases, opsonic therapy in 170
Skin, tuberculosis of 211
Skin, venous angioma of, showing beginning malignancy 9

PAGE.
Stelwagon, H. W., discussion on liquid air in dermatology 133
Syphilis, cutaneous, vessel changes and other histologic features of 86
Syphilis, treatment of, by intramuscular injections of insoluble mercurials 37
Taylor, R. W., cytology of gonorrheal discharge..... 277
Taylor, R. W., deformities of vulva from early and late indurating edema 20
Taylor, R. W., discussion on deformities of vulva, 35; on lichen planus, 198; on treatment of syphilis, 46; on tuberculosis of the nose 276
Trichopathophobia 102
Tuberculosis, cutaneous 74
Tuberculosis of the nose, exhibition of patient with..... 271
Varney, H R., discussion on opsonic therapy in skin diseases... 181
Varney, H. R., opsonic therapy in skin diseases..... 170
Vulva, deformities of, from early and late indurating edema... 20
Wallhauser, H. J. F., discussion on tuberculosis of nose 274
Wallis, J. F., cutaneous tuberculosis..... 74
Wallis, J. F., discussion on phototherapy..... 156
Whitehouse, H. H., discussion on liquid air in dermatology..... 136
Whitehouse, H. H., liquid air in dermatology..... 116
Zeisler, J., discussion on deformities of vulva, 35; on lichen planus, 197; on opsonic therapy in skin diseases, 180; on pemphigus, 169; on treatment of syphilis, 48; on tuberculosis of nose 274
Zeisler, J., observations on pemphigus 159